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CONTENTS

	Page
Original Papers	
Circinate retinitis; report of a case. Hunter W. Scarlett	633
The epithelial cell inclusions of trachoma; experimental studies. Ida A. Bengtson	637
The finding of bacterium granulosis (Noguchi) in trachoma. William C. Finnoff and Phillips Thygeson	651
Anterior and posterior dialysis of the retina. William O. Martin, Jr.	652
A method of mapping scotomata with tangent screen by binocular fixation. Alfred Cowan and Maurice E. Marcove	656
Studies in perimetry. 3, Errors of refraction, age, and sex in relation to size of the form field. C. E. Ferree, G. Rand, and M. M. Monroe	659
Notes, Cases, Instruments	
Melanotic mixed cell sarcoma of choroid. L. L. McCoy	664
The treatment of incipient cataract. Thomas Hall Shastid	665
A peculiar type of cataract. R. E. Wright	666
Society Proceedings	
Royal, New England, Philadelphia, Los Angeles, Memphis, Nashville	669
Editorials	
Cylinder skiascopy, radium for trichiasis, protein therapy, Goethe and spectacles	684
Book Notices	688
Correspondence	689
Abstract Department	691
News Items	708

For complete table of contents see advertising page V

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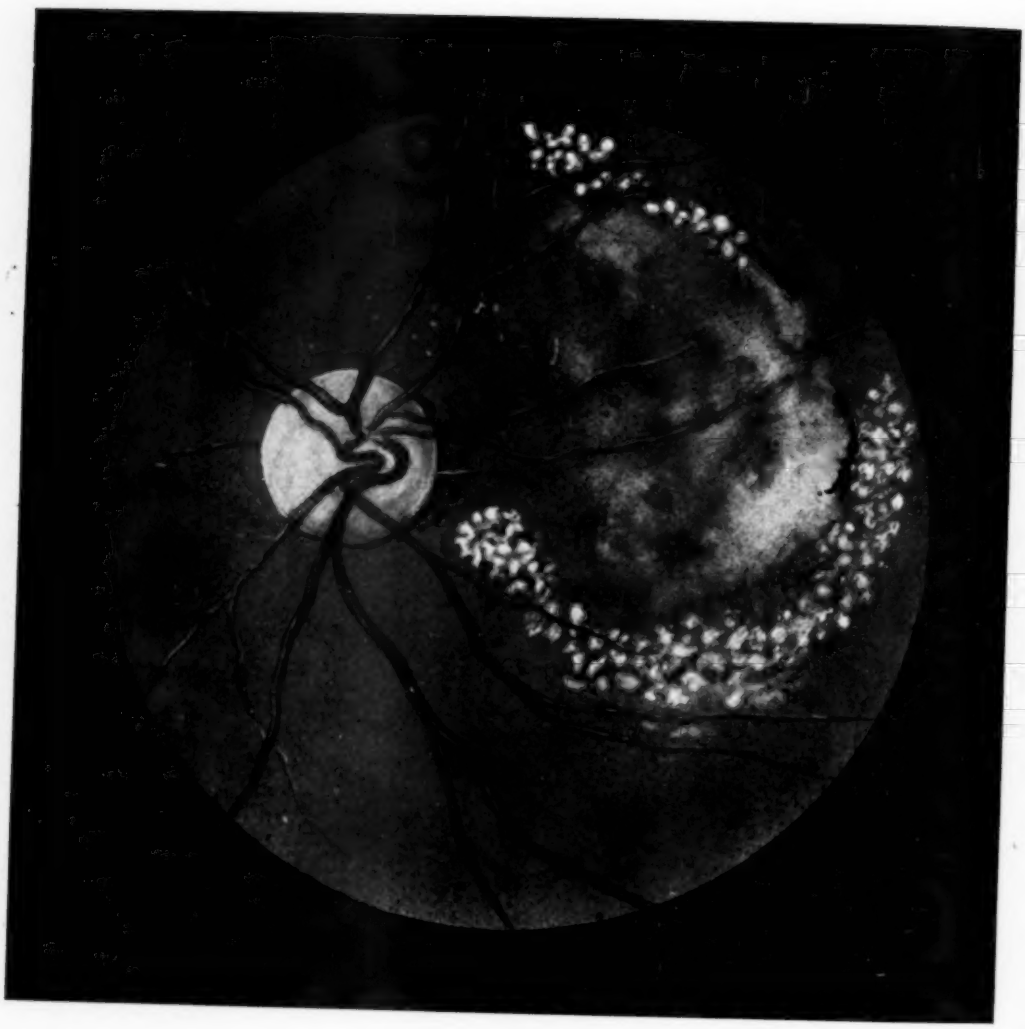

CIRCINATE RETINITIS. (HUNTER W. SCARLETT)

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CIRCINATE RETINITIS: REPORT OF A CASE

HUNTER W. SCARLETT, M.D.
PHILADELPHIA

A man of seventy-three years presented badly sclerotic retinal vessels. The right macular region had two white spots of apparent atrophy, surrounded by numerous yellow dots; while the left eye had a series of hemorrhages to the temporal side of the disc, accompanied at first by a broken crescent of whitish brown dots and, below the inferior macular vessels, two confluent white patches of exudate. Some months later the hemorrhages had disappeared, and there was an irregular crescent of exudative areas, the ends of the crescent resting on the upper and lower temporal edges of the disc. Similar developments, at an earlier stage, were proceeding in the right fundus. The literature of the subject is reviewed.

Our uncertainty as to the etiology of circinate retinitis, together with the remarkable series of changes which it undergoes from the first appearance of a hemorrhage to its transformation into a wreath of exudate, and its later disappearance, makes this disease one of unusual interest.

Hutchinson[1], in 1876, was the first to describe this condition under the heading of "symmetrical central choroido-retinal disease occurring in senile persons". Fuchs[2], in reporting twelve cases in 1893, called it circinate retinitis. About one year later, in 1894, de Wecker[3] published his series of cases, some of which had been under observation for over six years. Since then numerous others have been reported.

Case: The patient, seventy-three years old, whose case is herein described was admitted to the out-patient department of the Bryn Mawr hospital on March 2, 1928, complaining of blurred vision for reading extending over a period of five weeks. His vision was six-ninths in the right eye, and counting fingers in the left.

The previous medical history included Neisserian infection when a young man. About ten years ago the patient had suffered from an attack of articular rheumatism in both knees, compelling him to remain in bed eight weeks. His mother and one sister had died of pulmonary tuberculosis.

External ocular examination revealed nothing of importance. Ophthalmoscopy of the right eye showed the media to be clear, the disc well defined and slightly paler than normal. The macular region presented two small atrophic looking white spots surrounded by numerous yellow dots. The periphery contained no lesions, but the vessels were markedly sclerosed, the arteries being narrow and tortuous, and the veins indented.

The left eye, when first examined on March 2, 1928, contained two hemorrhages to the temporal side of the disc. These later increased in number. Near the disc, above and below the sweep of the superior and inferior macular vessels, were a few discrete whitish-brown dots, forming a broken crescent. Further distant from the disc, below the inferior macular vessels, were two confluent white patches of exudate. Two months later, May 25, 1928, these two patches had united, and the hemorrhages had been almost entirely absorbed. One month later the exudate had increased so as to include the discrete spots noted above and below the macular vessels.

On October 19, 1928, five months after the first examination, all traces of

hemorrhage had disappeared, and starting from the upper and lower temporal edges of the disc, in a crescentic fashion, were several discrete and confluent areas, more marked below, extending down and out to a point beyond the macula and then upward to a point on a level with the upper border of the macula, forming an incomplete ring of serrated exudate around the lower and temporal sides. The crescent was fringed in spots by pigment, and over its lower portion coursed a branch of the inferior temporal artery.

In the center of the macular region was an irregular round yellowish-red area surrounded by a larger whitish mass. The vessels of the fundus showed marked sclerosis.

The blood pressure was 150/90. The Wassermann was negative. The left tonsil was filled with pus. The teeth showed pyorrhea alveolaris in moderate degree. The urine examination was normal, no albumin, sugar, or casts being present. The blood count was within normal limits, but the hemoglobin was down to seventy-four per cent.

Still later, on March 8, 1929, the upper arm of exudate had changed from a more or less narrow serrated mass to a broader sheet-like one which extended down and joined the macular exudate. The latter had increased in extent, had become lighter in color, and contained several small spots of hemorrhage.

The right fundus showed several white spots of exudate, beginning about 1.5 disc diameters from the disc along the sweep of the superior temporal vessels and extending out beyond the upper margin of the macula. In the center of the macula was a triangular sheet of exudate about 1.5 times the size of the disc. Just below this macular exudate were two small round hemorrhages. Evidently a similar condition was progressing in the right eye. Curiously enough the vision in the latter had diminished within the year from 6/9 to counting fingers while that of the left eye had improved from counting fingers to 3/40.

Fuchs has ascribed the origin of the white spots in circinate retinitis to fibrinous exudate in the deeper layers of the retina, while de Wecker thought they were due to fatty degeneration, the result of hemorrhage. He believed however that they were not due to a single factor, but to many, the result of circulatory changes. According to de Wecker, the exudate might assume any form or position. Amman[4] demonstrated that these white areas were derived from fatty cells where hemorrhages had been. In his microscopical study of a case, he found enormous thickening of Müller's supporting fibers of the retina, also long clots of blood and hyaline plaques in the internal granular layer. He concluded that white spots came from fatty cells appearing in places where formerly hemorrhages had been, but only at a time when nothing more of the hemorrhages remained at those points. Hyalin clots he thought resulted from disintegration of red blood corpuscles. The fat cells represented phagocytes, and probably originated from endothelial cells. His findings supported the theory of de Wecker as to the origin of the white spots.

De Schweinitz[5] speaks of circinate retinitis as having been attributed to a disturbance of the smallest macular vessels, especially of the arteries, also to long standing edema. Parsons[6] feels that not all the patches are due to hemorrhage, but that the resemblance between albuminuric retinitis and circinate retinitis is essentially caused by edema. Marcus Gunn[7] thought them simply one of the manifestations of long standing edema.

Collins and Mayou[8] likewise regard this condition as due to retinal hemorrhage. They believe it to be closely allied to the massive retinitis of Coats, and divide all cases into two groups, (1) those associated with marked intraocular degeneration, and thus seen in the elderly, and (2) those in which occur nose bleed and menstrual dysfunction, and therefore seen in the young. Clausen[9] is of the opinion that transitional forms between retinitis

circinata and the exudative retinitis of Coats exist, and that a like cause, such as a chronic infection, may produce either condition, causing the retinal changes by means of an embolism.

Dameno[10] says that retinitis circinata may be due to sclerosis of any retinal vessels, but particularly those in the nerve fiber layer. He further states that hemorrhages or exudates are the products of sclerosis, being situated mostly in the inner nuclear layer.

Benedict[11] reviews the different opinions as to the origin of the white spots. He thinks there is insufficient evidence to state that hemorrhages always precede the white spots. That the retinal changes are not entirely due to arteriosclerosis he infers from the number of cases observed in young patients. He finds that tortuosity and vessel changes are rarely seen in recent cases.

Blake[12] examined a case before any pathological changes occurred. Hemorrhages appeared first, followed by exudate. There was sclerosis of the retinal vessels, associated with chronic interstitial nephritis and a blood pressure of 200 mm. Seen five months later there was a typical wreath around the macula, with several small hemorrhages at the lower edge of the wreath.

Weeks[13] thought the spots of exudate were due to coagulation of fibrin, and did not come from hemorrhages, but that exudate and hemorrhages both came from the same condition, namely changes or degeneration of the blood vessel walls.

Goldzieher[14] also thought the spots were produced by changes in the vessels, especially those supplying the macular region. The article in the American Encyclopedia of Ophthalmology[15] infers there is an underlying arteriosclerosis, always with some accompanying macular change, causing impairment of vision.

It is interesting to notice the frequency with which tuberculosis or some other condition has either been found in the patient or recorded in his family history. In the case herein reported the patient's mother and one sister had died of pulmonary tuberculosis. Holmes Spicer[16] recorded a case in which there was tuberculosis on the mother's side, and the patient had jaundice at three years of age. In one of two cases reported by Lauber[17], the second had bilateral apical lung involvement, while the other was a tobacco worker with diabetes, varicose veins, arteriosclerosis, and gangrene of the leg. Benedict[11], whose patient had tuberculosis associated with the retinal condition, thought the metabolic changes were due to tuberculosis.

In the discussion of Bane's[18] two cases, Koeppe said one must consider the possibility of a more or less typical tuberculous periphlebitis around the macular region, resembling retinitis circinata, while Jackson[19] remarked that the white patches seen at times in retinal disease following influenza were similar to those of circinate retinitis. He further pointed out that the exudate in influenza or tuberculosis might disappear, with restoration of normal vision, but that in circinate retinitis vision never became normal again, although the exudate might be absorbed.

Nicoletti[20] regarded the ring scotomas of albuminuric retinitis and retinitis circinata as identical, and as due to lesions in the internal and middle layers of the retina. Batten observed increased tension associated with a deep glaucomatous cup, which Butler thought was a cavernous atrophy of the disc. Nitsch's case had a detachment of the retina with changes above the disc resembling retinitis circinata. New vessel formation has been recorded once, in a case reported by Fridenberg. According to Harms, changes may or may not occur in the macula, but when they do occur they follow the formation of the white spots. Coppez and Danis noted a case in which hemorrhages were found after the exudate appeared. This may however have been a coincidence.

Comment: From the considerations above presented it would seem that circinate retinitis should not, etiologically, be classified as a distinct entity, because of its close rememblance to

Coats's disease, nephritic retinitis with exudates, some similar appearances resulting from influenza, and even those of marked retinal arteriosclerosis associated with hemorrhages and exudate. The beginnings of all of these conditions are frequently so similar that it is impossible to determine the ultimate result. That there is a fundamental disturbance of the vascular system seems quite evident, but some special factor must underly the vascular disorder. Whether this factor is a focal infection, or some grave systemic derangement arising from the kidneys, the lungs, or some intercurrent infection has not been determined.

The fact that the majority of cases occur in the aged and persist over a long period of time indicates the chronicity of the underlying causation, but on the other hand the lesion has been observed in a patient only twelve years of age (Wellerts), pointing to a more or less acute determining factor.

The typical course of the disease may be stated as follows: Hemorrhage first appears, and is followed by exudate which may take almost any shape or appear in any part of the fundus, but eventually assumes the typical circinate arrangement. This may again disappear partly or completely and be later replaced a second or third time by other patches of exudate. Always associated with the condition is a macular lesion, which may begin as a small greyish spot of exudate, and gradually increase in size until it takes the form of a sheet covering the whole macular region. This mass, accompanied by a distinct diminution of vision, may later assume a greyish-red or red color, and may end as a contracted pigment area, or the center of the macula may present a yellow spot.

Conclusions

(1) The exact etiology of circinate retinitis has not been definitely determined, although most observers agree that arteriosclerosis is a potent factor.

(2) Hemorrhages probably precede the exudative foci.

(3) In many cases recorded, some metabolic disturbance is either found in the patient or recorded in his family history.

(4) Macular vision is invariably diminished, although several improvements and regressions occur before the final state is reached.

(5) The appearance and disappearance, several times, of patches of exudate is quite characteristic. Such exudate in almost any shape may occur in places other than the perimacular region.

230 South Twenty-first street.

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THE EPITHELIAL CELL INCLUSIONS OF TRACHOMA

Experimental studies

IDA A. BENGTSON, Ph.D.
BACTERIOLOGIST, HYGIENIC LABORATORY,
UNITED STATES PUBLIC HEALTH SERVICE

The origin and nature of the inclusion body was investigated in film preparations from 230 cases diagnosed as trachoma, as well as in sections of tarsi and of excised follicles. Inclusion bodies were found in forty-five per cent of the cases studied. The various stages of development of the inclusion body are described in detail. The "elementary bodies" of Prowazek and the "initial bodies" of Lindner were produced experimentally in the conjunctiva of guinea pigs, by inoculation of certain gram-negative rod-shaped organisms isolated from the conjunctiva of trachoma patients. The inclusions in the epithelial cells are regarded as originating from rod-shaped microorganisms which tend to occur as diplobacilli, and the development of the inclusion body is attributed to multiplication of the organism within the cytoplasm of the cell and subsequent reaction by the cell.

Epithelial cell inclusions in trachoma were first observed by Prowazek and described by him in collaboration with Halberstaedter in 1907. Up to that time no agent which could be regarded as specific had been found in microscopic examinations of conjunctival material from cases of trachoma. The finding of the inclusion bodies was eagerly seized upon as offering the possibility of a solution of the trachoma problem. Following the announcement of Halberstädter and Prowazek similar bodies were observed and reported by numerous workers in various parts of the world, and the presence of the inclusion bodies has been associated more or less closely in the minds of many workers with the etiology of the disease notwithstanding the fact that epithelial cell inclusions are to be found in other conjunctival diseases.

Various theories have been formulated in regard to the nature and significance of the inclusion body. Not all workers are agreed that the inclusion bodies are or originate from living organisms. Very recently the view that the inclusion bodies in trachoma are the result of nuclear degeneration has been reiterated by several workers (Lumbroso and Trapezontzewa).

A number of years ago Wolbach and McKee considered the inclusion bodies to be products of mucous secretion under pathological conditions. Noguchi in his early work considered them to be bacterial in character, originating from the growth of certain cocci. Similarly Williams and coworkers considered them as "nests" of hemoglobinophilic bacilli developing in the cytoplasm of the epithelial cell.

Others have considered them as due to the growth of some microorganism nonbacterial in character. Among these are included the "initial bodies" of Lindner and the chlamydozoa (mantle animals) of Prowazek.

The chlamydozoa may best be described by translating from the original work of Prowazek and Halberstaedter: In the preparations stained with Giemsa there were visible inside the epithelial cells in the light blue protoplasm adjacent to the nucleus dark blue-stained, nonhomogeneous, irregular inclusions (first observed by Prowazek). The imbedded bodies, usually small and round or oval, gradually become larger, assume a mulberry form, and with increasing growth undergo a progressive dispersion which begins at the center. Subsequently they usually form a cap over the nucleus. Then there appear inside the inclusion red-stained, distinct, very fine bodies, which increase rapidly, gradually causing the disappearance of the blue-stained mass. Finally they occupy the greater part of the protoplasm, while the blue-stained substances are visible only as small islands between them. In streak preparations one may see the fine bodies also beside the cells.

It was the belief of Prowazek and Halberstaedter that the small reddish-stained granules were the active virus of the disease, and these were designated by them as "elementary bodies".

Later Lindner, in a study of sectioned material, found that the inclusion bodies in the epithelial cells presented an appearance quite different from those in streak preparations. In the protoplasm of the cell there occurred sharply defined bodies of the size of a coccus, either singly or in pairs, or in groups within a distinct vacuole in the protoplasm. These coccus forms were designated "initial bodies" by Lindner and were considered by him to be the active agent in the disease.

In the larger inclusions coccus forms of greater size were found near the periphery, while toward the center were to be found the smaller granular bodies corresponding to the "elementary bodies" of Prowazek and Halberstaedter. The small granular forms were considered by Lindner to be degeneration forms of the initial bodies.

In addition to the larger coccoid forms in the inclusion bodies Lindner also found in streak preparations forms which he designated as "free initial bodies". These bodies, which stained a pale blue with Giemsa stain, were sometimes rounded, sometimes elongated forms showing bipolar staining. Curious ring forms, biscuit or barrel forms, and sickle forms were to be found, but occurring most frequently were the bipolarly stained forms. The "initial bodies" have been regarded by Lindner as nonbacterial in nature and as being concerned in the etiology of the disease, and this theory has been given considerable attention.

In an attempt to elucidate the problem of the inclusion body and to determine its relation to the disease, the writer has undertaken a microscopical study of a number of specimens from cases of trachoma received at the United States trachoma hospital in Rolla, Missouri. At the hospital, which has a capacity of thirty-two beds, between two and three hundred patients are treated in the course of a year, affording a large amount of material for the study of the disease.

This study divides itself into two parts; first, a study of the inclusion bodies in film preparations and in sections; and second, attempts to produce experimentally forms corresponding to the inclusion bodies, "initial bodies", and "elementary bodies", by the inoculation of microorganisms isolated from trachoma cases into the conjunctiva of laboratory animals.

I. The origin and nature of the inclusion body

For this investigation film preparations have been examined from two hundred and thirty cases diagnosed as trachoma, the diagnoses having been made by Acting Assistant Surgeon Robert Sory and Assistant Surgeon W. C. Plumlee, medical officers in charge of the hospital, and Surgeon P. D. Mossman, medical officer in charge of trachoma prevention, United States Public Health Service. In addition to the conjunctival material, sections of tarsi and conjunctivæ removed in two tarsectomy operations performed by

Dr. John Green, Saint Louis, and sections of several excised follicles and portions of tarsi removed in fifteen entropion operations have been examined.

Inclusion bodies were found in forty-five per cent of the cases studied. Giemsa stain has been employed in most of the work, though Lindner's contrast stain has been used to some extent. The majority of films have been treated according to the usual method of dry fixation; a few were treated according to Lindner's method of wet fixation. For the sectioning of the material from the entropion and tarsectomy operations, I am indebted to the Eye Research Bureau maintained by the Missouri Association for the Blind and the Saint Louis University medical school, by arrangement through Dr. Harvey D. Lamb of Saint Louis.

All of the patients were of the white race, the majority coming from the Ozark region and the southeastern part of the state of Missouri. The great majority had a family history of the disease. The clinical appearance of a large number of the cases was that of true trachoma, with follicle formation and hypertrophy and congestion of the palpebral conjunctiva. A high percentage (eighty-three per cent) showed pannus formation, and a number had ulcers of the cornea. The more advanced cases showed the usual sequelæ, including trichiasis, entropion, and thickening and deformity of the tarsus. Film preparations for purposes of microscopic examination were obtained from only such cases as showed a condition of activity.

The plan of the work was to make a comparative study of numerous preparations showing the inclusion body in as many different stages as possible and particularly the early stages. Records by micrometer readings of the mechanical stage have been made of numerous fields showing inclusion bodies, so that these fields could be relocated for purposes of comparison and for refreshing the memory in regard to their appearance.

The various stages of the inclusion body as interpreted by the microscopic findings may be described as follows, these being given in reverse order for the sake of clearness:

(1) The final stage is that in which minute reddish or violet staining forms (Giemsa stain), which appear to be very small cocci, often in pairs, are found emerging from the cytoplasm of the epithelial cell, or lying free outside the cell. (Figures 6, 15, 32, 34.) When seen at this stage these small bodies are often indefinite, but at times they are very definite in form and outline and stain uniformly. In morphology, grouping, and staining properties they resemble very small cocci, though at times they may appear slightly elongated. These small bodies have been variously spoken of as points, granules, and so on, and the statement has been made that the inclusion body "breaks up" or disintegrates into the small bodies, giving the impression that they are irregular in form when, as a matter of fact, they are quite uniform in size. The small coccus forms have, in a few cases, been found lying free in fields considerably removed from any epithelial cell, and they have also been found in the leucocytes. (Figure 7.)

(2) The stage preceding the final stage is that in which the small reddish or violet staining cocci lie embedded in a blue staining matrix or "mantle," in the cytoplasm of the epithelial cell. Owing to the presence of the "mantle," the small cocci appear much less distinct and more indefinite in outline than when occurring free outside the cells. (Figures 4, 5, 13, 14, 15, 16.) Seen at this stage they were designated by Prowazek as "elementary bodies". The "mantle" varies in density, the small coccoid bodies showing through with more or less distinctness.

(3) The stage preceding the "mantle" stage is that in which the inclusion body appears as a dense, deeply staining blue or purplish mass (Giemsa stain), which may show no structure (figure 4) or which may be described as coarsely granular or lamellar in structure (figures 3 and

12). In this stage, as in the stage preceding, the mass may be adjacent to the nucleus and crescentic (figures 14, 15, 16), but it is not necessarily so (figures 3, 12).

(4) In a still earlier stage the inclusion body is less dense and the structure may be more easily distinguished. It may occasionally show very definite rod-like or diphtheroidal structure. (Figures 2, 31.) The individual organisms may at times be seen very distinctly. More often, however, the picture is not so clear and the individual organisms appear indefinitely outlined. In spite of this, however, the rod-like structure may often be seen. Very short diplobacilliform organisms, scarcely distinguishable from diplococci, have been found (figure 2). The latter probably correspond to Lindner's "initial bodies". In a few cases a single rod, apparently in the cytoplasm of the cell and adjacent to the nucleus, has been seen.

(5) In many specimens, rod-shaped bacteria, though few in number, may be found free outside the cells (figure 1). After examining a large number of slides one becomes impressed with the fact that if any organisms whatever are found they are practically always rod-shaped in form, often occurring in pairs. The outer ends of the pairs show at times a tendency to be pointed, though there are gradations between these and quite rounded ends. The length of the organism is also variable. Some of the diploid forms are so short that they present the appearance of diplococci (figure 1). The distinguishing characteristics of the organism, however, are its definite rod form and its tendency to occur in pairs.

Considering the stages of the inclusion body described and the fact that the inclusion body in all probability must originate from some organism entering the cytoplasm from without, as well as the presence of rod-shaped microorganisms outside the cells, and the rod-like structure of the early stages of the inclusion body, one is led to the conclusion that it is a rod-shaped organism which enters the cell, multiplies therein, and forms the inclusion body.

The process of development of the inclusion body is probably as follows: After the entrance of the rod-shaped organism into the cytoplasm of the epithelial cell, it begins to multiply. The protoplasm of the cell offers a certain resistance, which is probably mechanical, in consequence of which the organisms are prevented from spreading out into the cell and grow into a densely packed mass of which it is difficult to determine the structure. After multiplication has progressed to a certain stage, apparently a reaction on the part of the protoplasm against the invading organism takes place. The mass which stained a deep blue with Giemsa stain, indicating viability, now becomes more diffuse, staining a lighter blue, forming the "mantle". There appear small reddish staining coccoid forms, the "elementary bodies" of Prowazek scattered throughout the "mantle". The interesting question in this connection is what is responsible for the transformation which takes place in the inclusion body. In answering this question it must be taken into consideration that the epithelial cell is in all probability a viable cell and as such it reacts against the invading foreign body. This is probably accomplished by means of some substance which has a tendency to dissolve the foreign body. The action of the lytic substance on the mass of bacteria transforms it into the peculiar body we see, the blue staining "mantle" probably representing the dissolved portion of the bacteria, or possibly this together with some of the lytic substance itself, and the "elementary bodies" the residue of the bacteria. This matter will be considered more at length in the second part of this paper.

The reddish staining coccoid forms, though differing in appearance to such an extent from the rods, nevertheless show evidence of having originated from them, in that they frequently occur in pairs, and this, as previously

stated, is true also of the rods. The occurrence of these coccoid forms in definite pairs (figures 6, 17) is perhaps the best evidence that the inclusion bodies are parasitic in character and are formed as the result of the multiplication of a living organism. The formation of precipitate in the cytoplasm of the cell, through material extruded from the nucleus, or through cytoplasmic disintegration, or through mucous secretion, would not show this definite structure.

Whether these small forms which are undoubtedly filterable are viable is a question. If intensity of staining reaction is a criterion, it would appear at times that they are. When occurring in the cytoplasm of the cell, they become more and more distinct as the "mantle" fades, and they are sometimes quite deeply stained. They emerge from the cell, and when found in the neighborhood of the cell they may also be stained rather intensely, appearing reddish violet in color. When found at a distance from the epithelial cells they are usually more faintly stained and, on account of their small size and indefinite staining, are difficult to distinguish. In the leucocytes they have been found distinct enough in outline and staining reaction to be easily distinguishable, though more often bodies have been seen in the leucocytes which are only suggestive of the small coccoid forms on account of their faint staining and indefinite outline.

Additional evidence of the origin of the inclusion bodies from rod-shaped organisms occurred in a chance finding in a specimen of blood collected from the scarified conjunctiva of a trachoma patient for the purpose of making a white-cell count. The specimen was collected with the diluting fluid containing acetic acid and was allowed to stand for several hours. As it was found unsuitable for the purpose for which it was collected, a film of the material was made on a slide, and it was fixed with methyl alcohol and stained with Giemsa stain in the usual way. In the specimen was found the nucleus of an epithelial cell surrounded by a large number of rod-shaped bacteria, many in pairs. The appearance was as though the diluting fluid had dissolved the cytoplasm of the cell, allowing the organisms, which may have been present as one mass or several densely packed masses of organisms forming inclusion bodies, to be dispersed, so that their morphology was plainly evident. Attention is called to the considerable amount of pleomorphism found (figure 11). Several other similar cells were found in the same preparation, but none so distinct as the one reproduced.

In sections of specimens of conjunctiva from trachoma cases, groups of rod forms, sometimes in dense masses, have been found to occur (figure 10). These stain blue with Giemsa stain and at times may be distinguished only with difficulty. They show the same tendency to occur in pairs as do the organisms found in film preparations of the conjunctiva.

In the groups of rodlike organisms in sectioned material evidence has been found of the origin of the Lindner "free initial bodies", the peculiar cylindrical or oval forms stained at the rim and bipolarly, which are the most puzzling of any of the forms found in trachomatous material (figures 8 and 18). Though not occurring frequently in film preparations from the conjunctiva, they have been found very much in evidence in a few specimens and have been seen occasionally in a number of others. In the sectioned specimens referred to these bipolarly staining forms have been found in the groups of rod forms and so closely associated with them that there seems little doubt that they are different forms of the same organism. The size and morphology of these bodies when seen free in film preparations are quite variable. Some give the appearance of having developed from a diplococcal form such as the short diplobacilli at times exhibit (figure 1). Lindner calls attention to the fact that they have been taken for gonococci.

Others are elongated and show the marginal and bipolar staining with clear center. Occasionally a "free initial body" has been seen closely associated with the small coccus forms outside the cell. It is probable that these forms also are due to the action of certain lytic substances in the conjunctiva which act on them to transform them into the unusual forms.

II. The experimental production in laboratory animals of forms resembling the "elementary bodies" of Prowazek and the "initial bodies" of Lindner

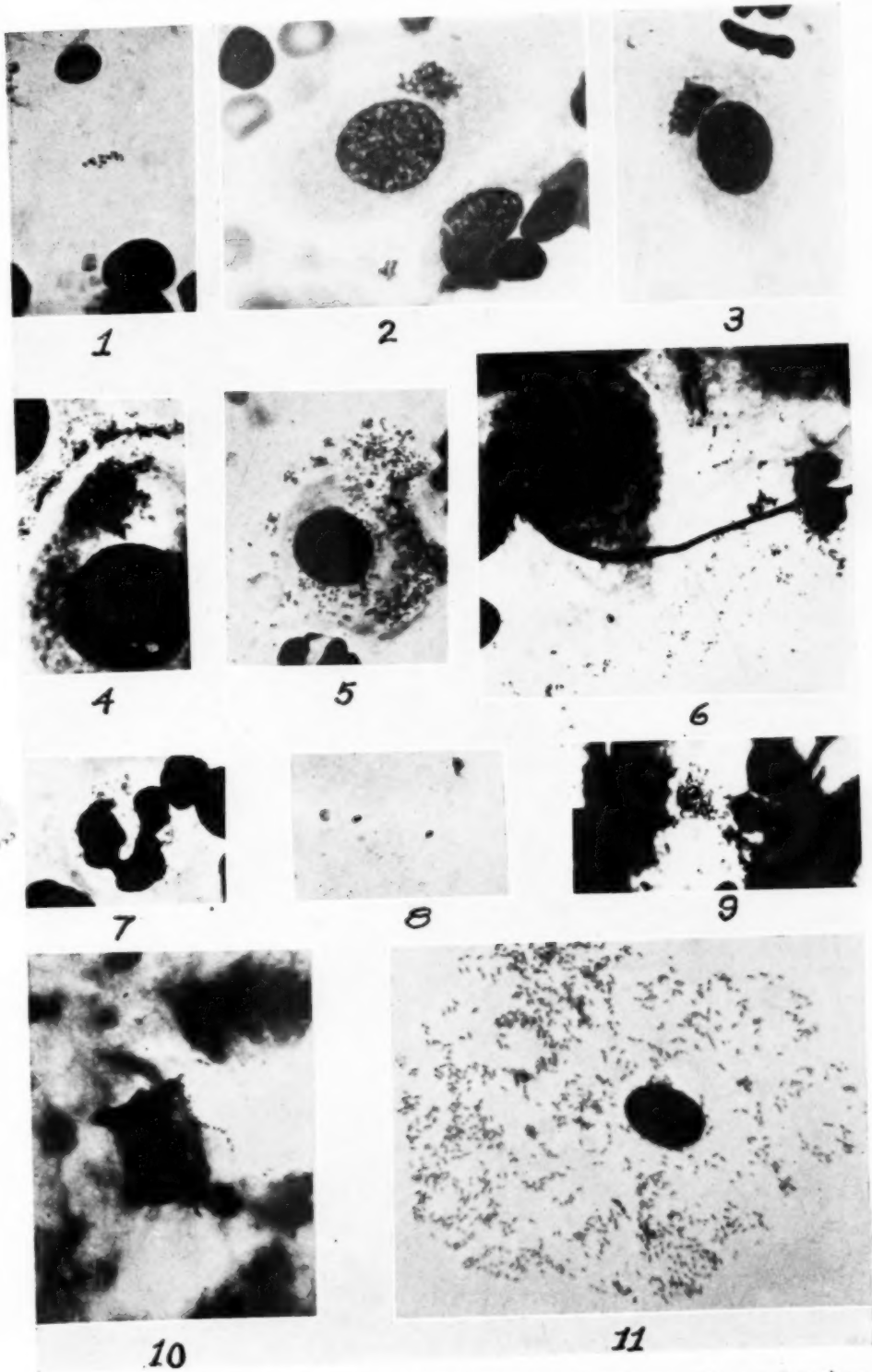
After the completion of the work reported in the preceding part of the paper and following the announcement of Noguchi that as the result of inoculation of a certain gram-negative rod-shaped microorganism isolated from human cases of trachoma he had succeeded in producing in rhesus monkeys a granular conjunctivitis resembling trachoma, attempts were made to isolate an organism corresponding to the one described by Noguchi. In addition to the inoculation of cultures into monkeys in an effort to produce the disease, inoculations of cultures were also made into other laboratory animals for the purpose of determining the effect of their presence on the conjunctiva, or of growth in the conjunctival tissues, on the morphology of the organism. It was desired to know whether forms corresponding to the inclusion bodies in the epithelial cells, the "elementary bodies" and Lindner "initial bodies", would develop.

Explanation of illustrations (Bengtson)*

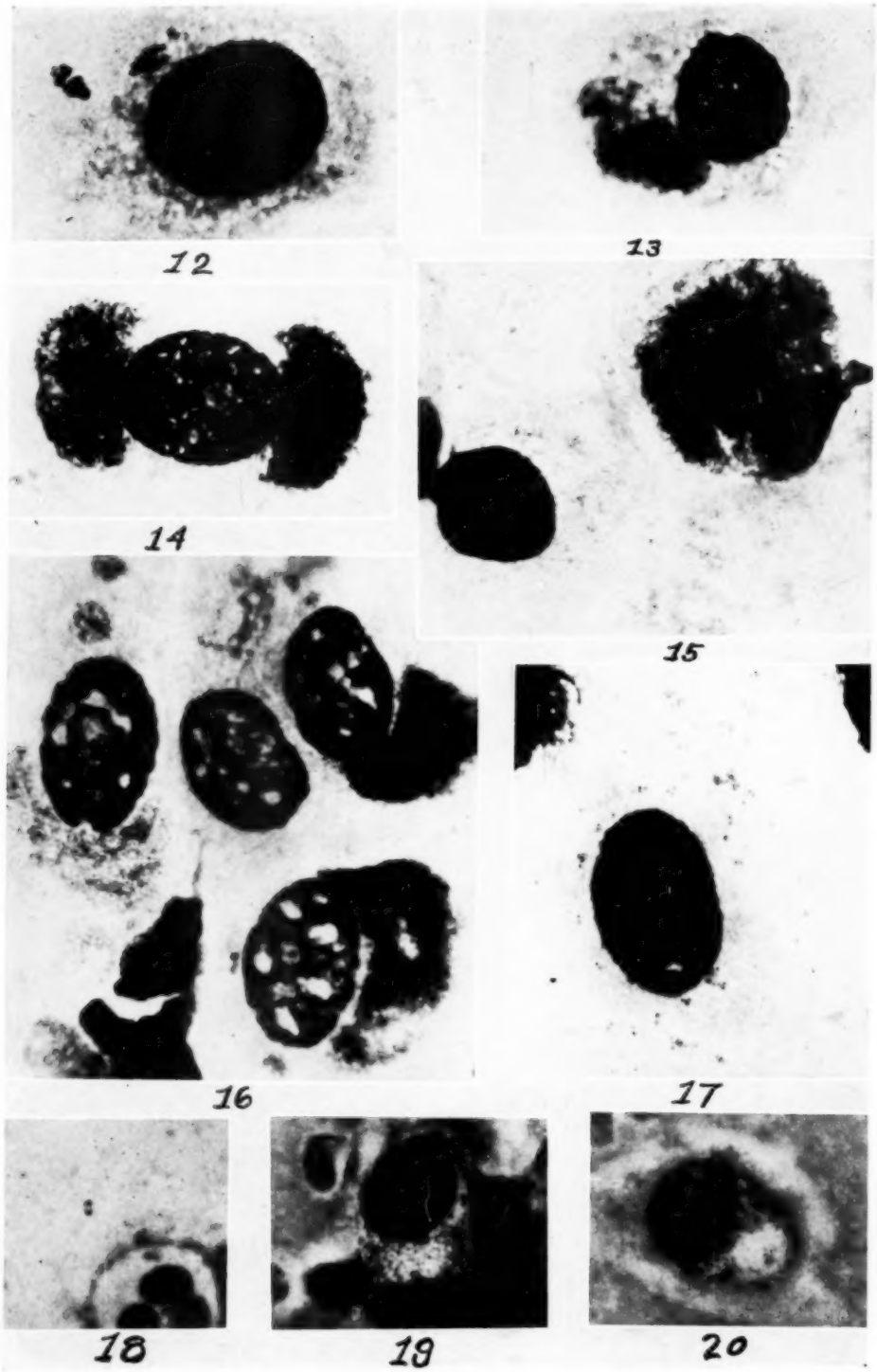
(All photomicrographs, except nos. 33 and 34, approximately × 1000; nos. 33 and 34 approximately × 2000; Giemsa stain.)

1. Group of rods occurring free. Variation in length and occurrence of several pairs one of which resembles a diplococcus to be noted.
2. Early stage of two inclusion bodies showing rod structure.
3. Somewhat later stage of inclusion body showing lamellar structure.
4. Inclusion body composed of dense mass of organisms of which it is not possible to determine the structure, except in the case of several organisms at the right of the inclusion body. Shows also portions of "mantle" and some small coccus forms ("elementary bodies" of Prowazek).
5. Small cocci in epithelial cell with trace of "mantle".
6. Small free cocci. Tendency to occur in pairs to be noted.
7. Small cocci in leucocyte.
8. Bipolarly stained short form resembling diplococcus ("free Lindner initial body").
9. Group of rods and bipolarly stained organisms ("Lindner initial bodies") in sectioned conjunctival tissue.
10. Dense mass of rods, some showing bipolar staining, in sectioned conjunctival tissue.
11. Rods surrounding nucleus of epithelial cells. Tendency to diploid formation and presence of some very short forms to be noted.
12. Early stage of inclusion body showing lamellar structure.
13-16. Inclusion bodies showing "mantle" and "elementary bodies".
17. Small coccoid forms occurring in pairs in cytoplasm of epithelial cell.
18. "Free Lindner initial body".
19-20. Inclusion bodies with wet fixation method.
21. Culture of gram-negative rod isolated from trachoma case.
22-27. Same culture in conjunctiva guinea pig.
22. Numerous small coccoid forms free and in leucocyte.
23. Some of the rod-shaped organisms in or on cytoplasm of epithelial cell and in leucocyte.
24. Forms resembling Lindner "free initial bodies" and transition forms between rods and "initial bodies".
25, 26. Bipolarly stained forms resembling Lindner "initial bodies" in or on cytoplasm of epithelial cells.
27. Group of bacteria near nucleus of epithelial cell suggesting inclusion body.
28. Culture of gram-negative rod from another trachoma case.
29, 30. Same culture in conjunctiva of guinea pig.
29. Small coccoid forms free and in leucocyte.
30. Numerous small coccoid forms mostly in the leucocytes.
31, 32. Beginning stage of inclusion body contrasted with final stage.
31. Group of rod-shaped bacteria in cytoplasm of cell.
32. Small coccoid bodies escaping from cell.
33. Inclusion body (no. 4 enlarged).
34. Small coccoid forms (no. 32 enlarged).

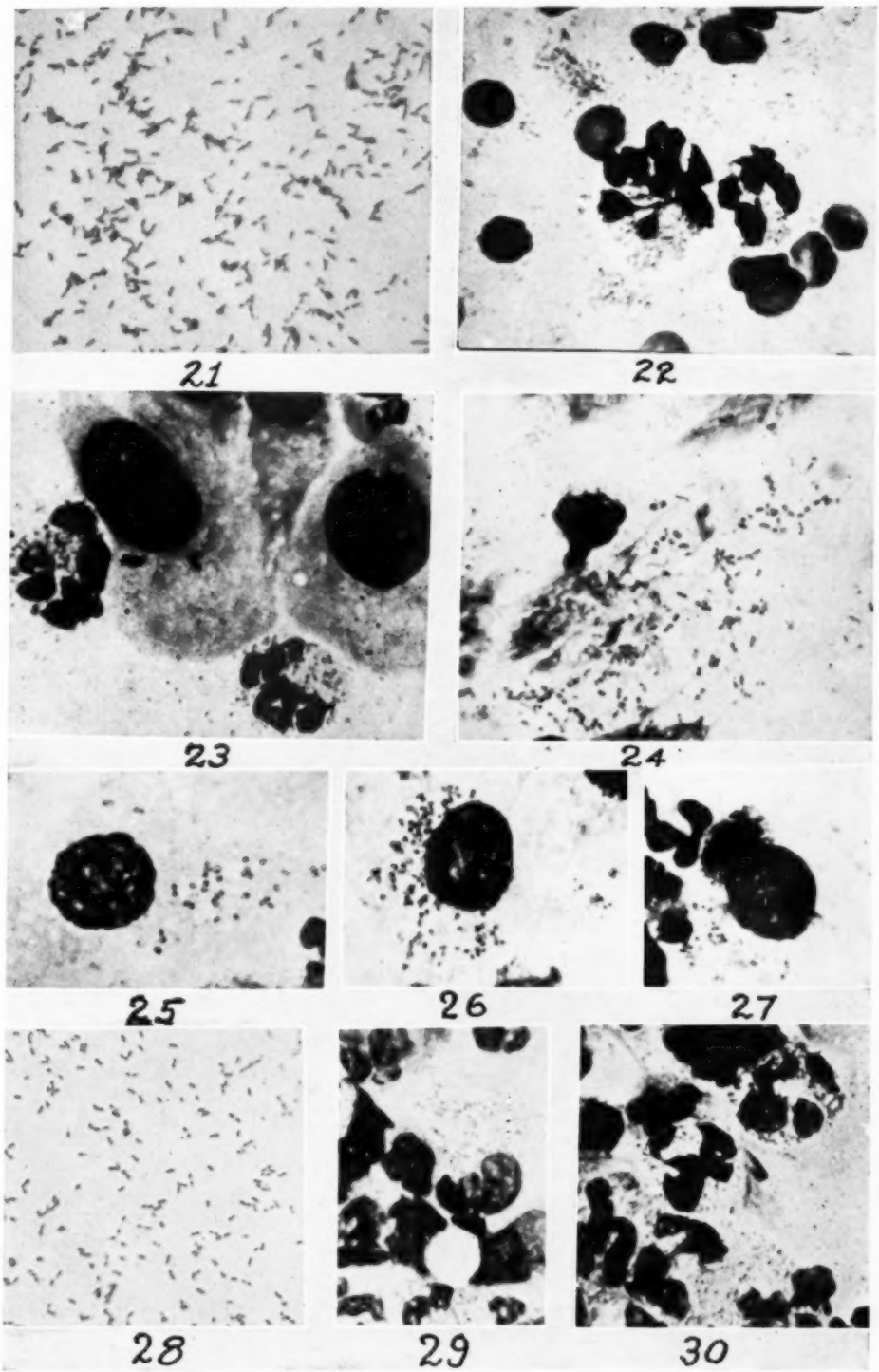
* Photographs by M. K. Underwood.



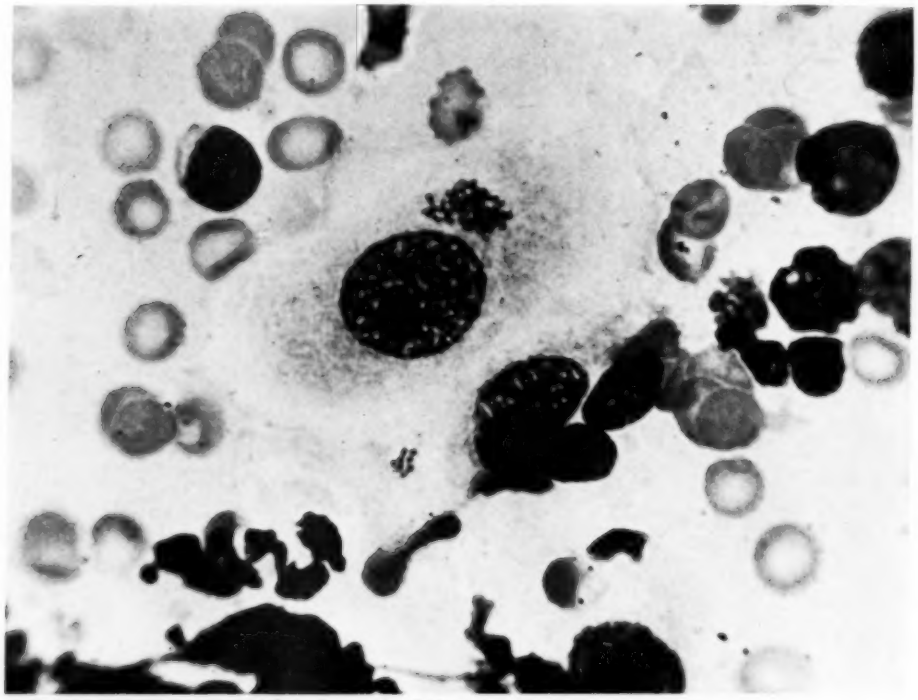
Figs. 1-11 (Bengtson). Epithelial cell inclusions of trachoma. See explanations, page 642.



Figs. 12-20 (Bengtson). Epithelial cell inclusions of trachoma. See explanations, page 642.



Figs. 21-30 (Bengtson). Cultures of gram-negative rods from trachoma cases and their appearance in the conjunctiva of guinea pigs. See explanations, page 642.



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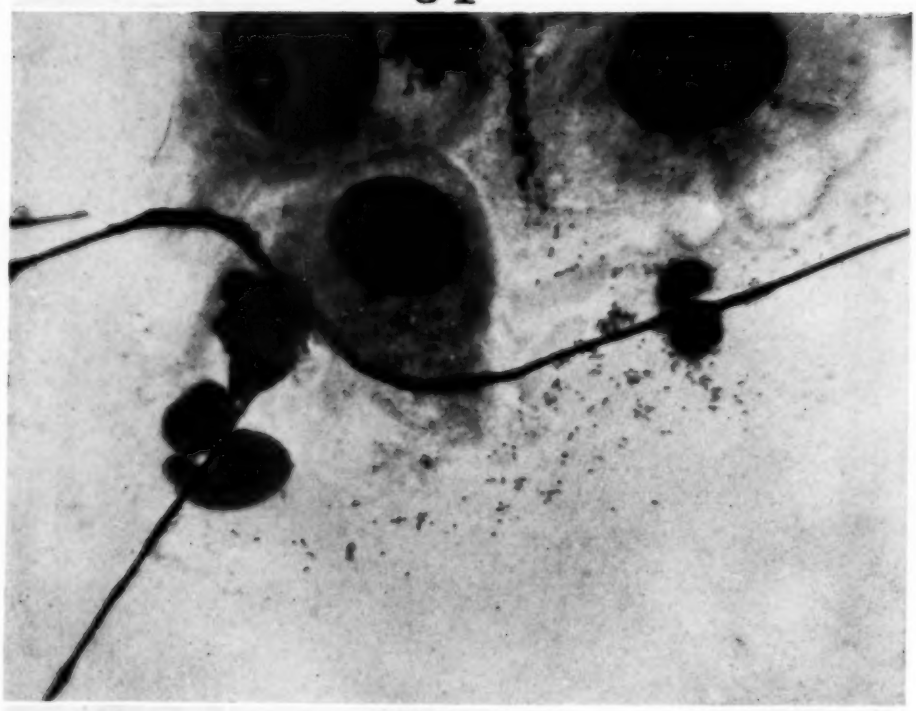

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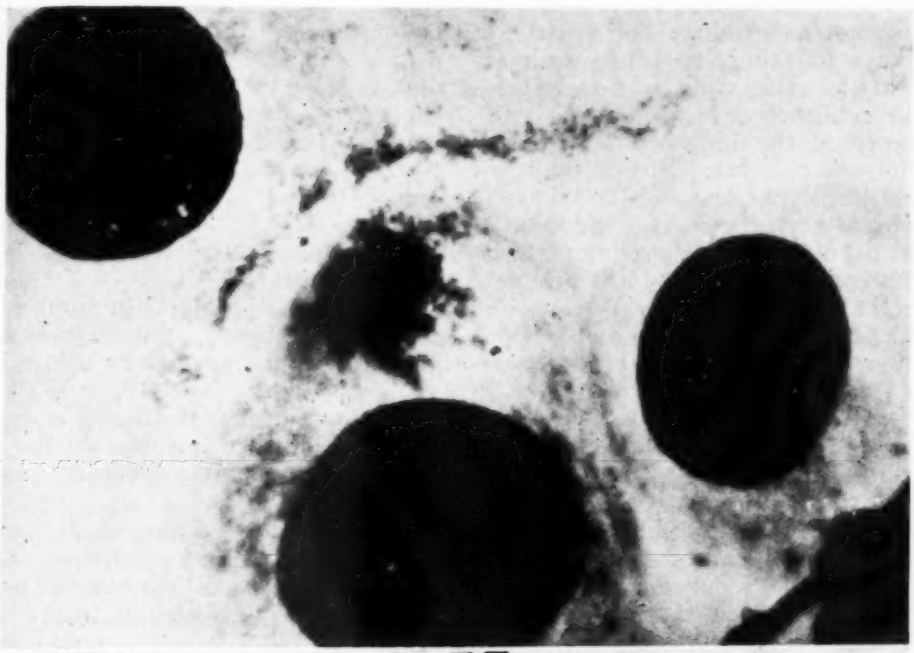
Figs. 31 and 32 (Bengtson). Epithelial cell inclusions of trachoma. See explanations, page 642.



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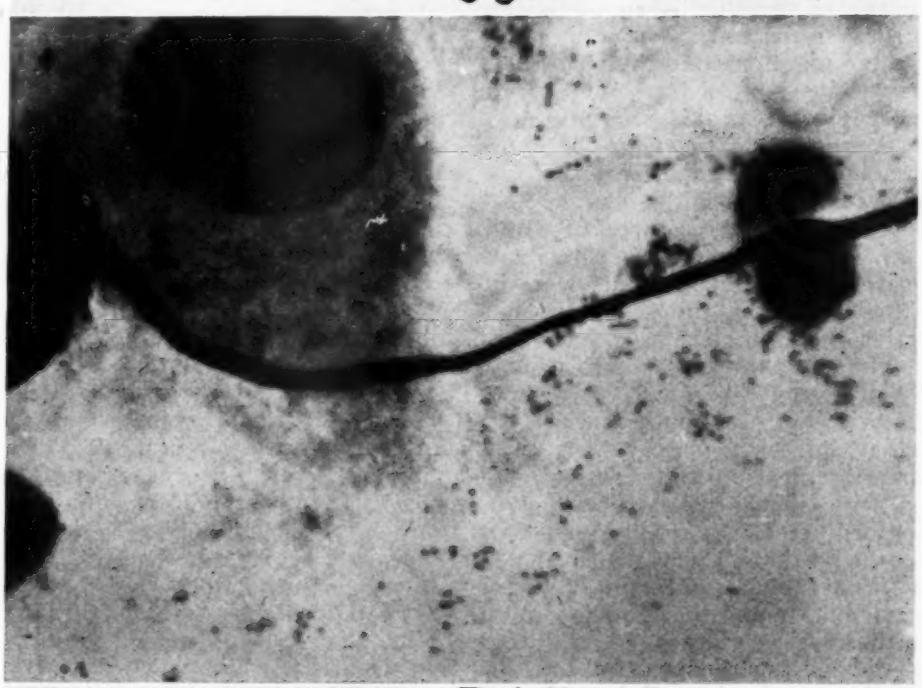

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Figs. 33 and 34 (Bengtson). Epithelial cell inclusions of trachoma. See explanations, page 642.

In a study of trachoma, it would be of interest to produce the disease in monkeys or other laboratory animals and, at the same time, to demonstrate in the conjunctiva of such animals the presence of the inclusion bodies and of the other forms. But it may not be desirable to disturb the possible development of the disease in monkeys after inoculation, by removing material for film preparations, and it is probably true that, even after the disease had developed, a great many preparations from a considerable number of monkeys would have to be examined in order to determine whether these bodies were present, judging from the difficulty with which they are found in human cases.

Small laboratory animals offer the advantage that many may be used and film preparations may be made as frequently as desired at various stages. Rabbits were found not suitable, for the reason that practically all rabbits show the presence of numerous faintly stained irregular rods. The conjunctiva of guinea pigs, on the other hand, appears to be almost free of bacteria, microscopically speaking. The guinea pig, therefore, appeared to be more favorable than the rabbit for performing the tests.

Several different cultures of gram-negative rods isolated from the conjunctiva of trachoma patients were inoculated at various times into the conjunctiva of a number of guinea pigs, and film preparations were made a short time after the inoculations, sometimes within a few hours, and for several days after the inoculations. The preparations were fixed and stained as usual with Giemsa stain. The preparations for microscopic examination were made early, for the reason that the organisms are most numerous shortly after inoculation and the chances of finding the desired forms are therefore probably greater than if much time had elapsed after the inoculation. It was not presumed, of course, that the disease itself could possibly develop in this short time.

The most noticeable feature in preparations made during the first day or two following the inoculation was the presence in enormous numbers of small pink staining coccoid bodies resembling the "elementary bodies" of Prowazek. These were to be found everywhere throughout the preparation, and the leucocytes were crowded with them. (Figures 22, 23, 29, 30.) On the other hand, the organisms originally introduced, which stain blue with Giemsa, were comparatively few in number and many were faintly stained, indicating loss of vitality. Apparently the original rod-shaped organisms (figures 21, 28) which stain blue with Giemsa stain had been transformed into the smaller coccoid bodies staining pink or reddish with Giemsa.

The presence of the small coccoid forms suggests an explanation of the "elementary bodies" seen in film preparations from the conjunctiva of trachoma cases. These, as stated previously, have been found within the epithelial cells embedded in the bluish "mantle", and also free outside the cells and occasionally in the leucocytes. In the case of the "elementary bodies" experimentally produced, it is quite evident that they were produced as the result of environmental conditions to which the rod-shaped bacteria introduced were exposed in the conjunctiva. That such forms are produced in the conjunctiva and not in ordinary culture media may be due to the fact that there are present in the conjunctiva certain substances antagonistic to the presence and to the growth of the invading organisms, which substances probably act by tending to dissolve them. When this lytic action takes place outside the cells, the portion which has been dissolved is not visible. The part which remains of each bacterium is the small coccoid eosinophilic portion, which probably corresponds with the "elementary body" of Prowazek.

Such lytic action may take place to some extent outside the epithelial cells in human trachoma, but it takes place also within the protoplasm of the epithelial cell. In this case the action is

probably similar to that occurring outside the cells to the extent that a lytic substance acts upon the bacteria which have invaded the cell and reduces them to the small reddish staining forms. Here the lytic substance is probably secreted or produced in the cell itself. The result of the lytic action within the cell, however, differs from that taking place outside the cell, in that the portion which has been acted upon by the lytic agent is contained within the cytoplasm of the cell for a time and still retains its basophilic property, and therefore stains blue as did the original organism, thus forming the "mantle" in which the reddish staining coccoid forms are embedded.

The lytic action within the cell may be either less in degree or it may take place more slowly than outside the cell. This is indicated by the fact that the small coccoid bodies when seen emerging from the epithelial cell appear to be stained more distinctly than are those found at some distance away from the cell. The slower or less complete action is also indicated by the fact that the "mantle" shows varying degrees of density, being very distinct in the early stages, then becoming less and less in evidence, and eventually being absorbed. As the "mantle" fades, the small coccoid forms become more distinct.

In regard to the nature of the lytic substance, the recent work of Fleming and Allison on "lysozyme" is very suggestive. This substance which has a "powerful inhibitory, bactericidal and bacteriolytic effect" on certain bacteria is present in the tissues and secretions of the body and occurs in particularly high concentration in human tears. It would seem that this substance plays an important part in bringing about the peculiar manifestations of the growth of certain bacteria in the conjunctiva.

In addition to the forms resembling the "elementary bodies", there were found in certain cases others corresponding to the Lindner "initial bodies" and the Lindner "free initial bodies". The latter are the bipolarly stained oval or cylindrical bodies which appear blue in Giemsa-stained preparations. These bodies present the appearance of being stained only at the rim, except at the ends where the stained portion is considerably wider. Some of the forms observed were perfectly definite in outline and stained fairly distinctly, and they correspond very well with those described and depicted by Lindner and resemble those found a few times in the film preparations from human cases of trachoma.

These bodies were found both free outside the cell (figure 24) and apparently within the cytoplasm of the epithelial cells (figures 25 and 26) in preparations made from the conjunctiva of guinea pigs a day or two after inoculation with a certain culture. Transitional forms between the rods and swollen bipolarly stained forms were readily distinguishable (figure 24). It seems probable, therefore, that the so-called Lindner "initial bodies" are modified or pleomorphic forms of rod-shaped bacteria, and that they are due to the unusual environmental condition in which they exist and are not peculiar organisms nonbacterial in nature as has been maintained by Lindner.

In the preparations examined, in a few instances there were found groups of bacteria in or on the cytoplasm of the epithelial cell (figure 27), suggesting inclusion bodies; but these did not show any evidence of having progressed to the stage where the small coccoid forms were in evidence and could not be considered truly typical. The bipolarly stained bodies corresponding with the Lindner "initial bodies" found in the cytoplasm of the cell (figures 25, 26) might also be regarded as "inclusion bodies"; but in this case also they could not be regarded as typical of inclusion bodies in human trachoma, as they occurred more or less separated from each other and not in the form of a dense mass. The fact is to be taken into consideration, however, that the epithelial cell of the guinea pig probably differs from the human epithelial cell, both as to consistency and as to lytic action of the cytoplasm, and probably also in re-

action. The action described is not specific, particularly in the case of the small reddish staining coccoid forms, for they can be readily produced by the inoculation of various gram-negative rods. The Lindner "initial bodies" were not so readily produced, and it is possible that these develop from a more limited number of organisms.

Summary

The microscopic evidence in a study of film preparations and sections of conjunctivæ and tarsi from cases of trachoma is that the inclusion bodies in the epithelial cells originate from rod-shaped microorganisms which tend to occur as diplobacilli, and that the development of the inclusion body after the entrance of the rod into the cytoplasm of the cell is due to the multiplication of the organism and subsequent reaction on the part of the cell against the invading bacteria, transforming them into the small reddish staining coccoid forms designated by Prowazek as "elementary bodies" with the blue staining "mantle" which represents the partially dissolved portion of the bacteria.

The "free Lindner initial bodies" appear to be pleomorphic or modified forms of rod-shaped bacteria which have been seen rather infrequently outside the cells and which occur as blue stained oval or cylindrical bodies stained at the rim and bipolarly. These are probably also formed as the result of the action of conjunctival fluids on the rod-shaped microorganisms.

In interpreting the inclusion body, the "elementary bodies", and "free initial bodies", the fact must be borne in mind that they are found in the conjunctiva, which on account of its exposure is particularly liable to the invasion of microorganisms and must therefore be unusually rich in protective substances probably lytic in action. These act on the bacteria to destroy or inhibit their growth, and it is not surprising that the latter should be changed into forms which are at times quite unrecognizable.

It has been possible to produce experimentally forms corresponding in appearance to the so-called "elementary bodies" of Prowazek and the "initial bodies" of Lindner, by inoculating into the conjunctiva of guinea pigs certain gram-negative rod-shaped organisms isolated from the conjunctiva of trachoma patients. A study of preparations made a short time after the inoculations suggests that the "elementary bodies" and "initial bodies" represent modifications of the organisms originally introduced, these modifications being brought about by the action of lytic substances contained in the conjunctival fluids and tissues.

Rolla, Missouri

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THE FINDING OF BACTERIUM GRANULOSIS (NOGUCHI) IN TRACHOMA

Preliminary report

WILLIAM C. FINNOFF, M.D., F.A.C.S., AND PHILLIPS THYGESON, M.D., DENVER

In four cases of trachoma, out of six from which material was studied by culture on leptospira medium, a minute gram-negative bacillus was recovered whose cultural and morphological characteristics corresponded to those of bacterium granulosis as described by Noguchi. From the department of ophthalmology, University of Colorado school of medicine.

In 1927, Noguchi, in a special report before the section on ophthalmology of the American Medical Association, described the isolation of a small gram-negative rod-shaped bacterium from cases of American Indian trachoma. When injected into the conjunctivae of macacus rhesus monkeys this organism produced a granular conjunctivitis with scarring which resembled, grossly and microscopically, trachoma in man.

Following Noguchi's technique we have studied bacteriologically six cases of trachoma in which the diagnosis could hardly be questioned. In four an active pannus was present and in the other two follicle formation with scarring had occurred. Only two cases had received treatment prior to culturing. Material for inoculation purposes was obtained in all but one of the cases by scraping the tarsal conjunctiva over the follicles with a platinum spatula, the lids being first anesthetized with 10 per cent cocaine. In the one case a plentiful supply of conjunctival and tarsal tissue was obtained at operation where grattage and expression of follicles was done.

Tubes of semisolid leptospira medium were immediately inoculated, incubated at thirty degrees centigrade, and examined at the end of six days. A mixed culture was invariably obtained. The usual contaminants were xerosis bacillus, various types of hay bacilli, and cocci, mostly gram-positive. In four cases a minute gram-negative rod was identified in smears and pure cultures were obtained by plating from the leptospira medium to the special blood agar described by Noguchi.[1] Colonies of this organism appeared in about four days as tiny transparent points, later developing a grayish translucent character which made them easily distinguishable from all other colonies studied. In from six to eight days they reached their maximum size, never, however, exceeding that of the ordinary streptococcus or pneumococcus colony. A temporary confusion occurred in two of the cases because of the presence in the primary cultures of a small gram-negative rod, somewhat larger than the organism described by Noguchi, but readily distinguishable by its profuse growth on plain agar and by pigment formation. It was later found to be bacillus pyocyaneus.

The minute gram-negative bacillus isolated from the four cases appeared to be identical morphologically and culturally with bacterium granulosis. Growth occurred only on special media except in a few instances in which a very heavy inoculation of pure culture had been made on ordinary blood agar. The bacillus was very actively motile, especially from young cultures on blood agar. Flagellum stains in our hands were not successful, even when used on known flagellated organisms such as bacillus typhosus and bacillus coli. Individuals in young culture measured on the average 0.4 by 0.9 micron and appeared under high magnification as rather plump short rods with rounded ends. In old cultures bizarre involution forms were found. The semisolid leptospira medium seemed most favorable for cultivation, growth occurring well at room temperature with the optimum at thirty degrees centigrade. There was no growth at thirty-seven degrees centigrade.

[1] Noguchi, H. Etiology of trachoma. Jour. Exper. Med., 1928, July, supplement 2.

Inoculation into the conjunctivæ of rabbits, dogs, and guinea pigs has failed to produce gross changes after six weeks. Subconjunctival injection into macacus rhesus monkeys has produced, after thirty days, definite hyperemia of the inoculated lids in four cases and marked folliculosis with spreading to the other eye in one. Sufficient time has not elapsed for us to draw any conclusions regarding these animals, but further details will be reported in a later communication.

Imperial building

ANTERIOR AND POSTERIOR DIALYSIS OF THE RETINA

WILLIAM O. MARTIN, JR., M.D.
ATLANTA, GEORGIA

In the first case a wound through the ciliary body was followed by formation of a cyclitic membrane, detachment of the retina at the ora serrata, and dislocation of the cataractous lens. In the second case the optic nerve and retina were torn from the nerve head by penetration of a piece of wood. This eye was myopic. From the eye clinic of the Landeskrankenhaus of Graz, Austria; Professor Maximilian Salzmann, director.

The retina is attached at only two places, in front by the ora serrata to the orbiculus ciliaris, and behind at the foramen opticum chorioideæ to the ocular end of the optic nerve.[1]

The term dialysis refers to the tearing away of the retina from one of these places, consequently there may be either an anterior or a posterior dialysis of the retina.

Scheffels[2] reports three cases of traumatic detachment from the ora serrata. Velhagen[3] also reports a case which likewise followed an injury, and he found another case in the atlas of Pagenstecher and Genth (1875, plate 28).

Paul[4] describes a case of detachment of the retina from the papilla. Velhagen[5] reports one in an eye with sympathetic uveitis following an injury. An interesting case was the one noted by Axenfeld[6] of metastatic endophthalmitis from pneumococcic meningitis.

Fuchs[7] reports a case of bilateral detachment of the retina from the ora serrata, in a child eleven years old, as the result of injury. Both eyes showed axial myopia.

While cases of each type of dialysis of the retina are found in the literature, they are rather rare conditions, and possibly worthy of mention. Undoubtedly cases occur which are not diagnosed, and sections for pathological study are not always available.

Case 1: Anterior dialysis of the retina. A boy aged eleven years had been injured in the left eye by a knife several months before observation. Examination of the eye showed a brownish-green atrophic iris, with many newly formed blood vessels on the anterior surface. In the nasal side of the pupil was a body of irregular surface, the shrunken lens, which was covered over by cicatricial tissue. Above and below, between the margin of the lens and the pupillary margin, a vascularized membrane was present. Punctate keratitis was present, and the anterior chamber contained a mass of grayish colored exudate. The tension was not markedly diminished. There was no fundus reflex or perception of light. The eye was enucleated because of suspected sympathetic ophthalmia.

The right eye showed no keratitis punctata, but there was posterior synechia, a greenish discoloration of the iris, and pigmented spots on the anterior lens capsule, united by fine threads so as to form letter-like figures. The fundus was veiled by these opacities but no pathology was seen.

After enucleation of the first eye the patient was kept under observation and notes made of the pro-

gressing sympathetic ophthalmia with few if any remissions. Five years later the globe was slightly atrophic, the cornea small, the iris covered with small round dark spots and somewhat atrophic toward the pupillary margin, and the lens cataractous. Notwithstanding all this, there was light perception and a fairly normal projection except temporally.

Histological examination of the enucleated eye shows the cornea to be a little distorted and edematous, which is commonly seen in inflammation of the uveal tract and in glaucoma. The iris is fixed to the pectinate ligament in its whole extent, giving the appearance of a compact mass, and Schlemm's canal is reduced to a small opening.

The anterior chamber contains a serous fluid which is continuous with the subretinal space.

On the temporal side, the uveal tract shows a high degree of infiltration, consisting of lymphocytes, epithelioid cells, and a few giant cells. The same is true on the nasal side except for the presence of the lens, which is fixed to the ciliary body by exudate.

In the region of the orbiculus ciliaris there is a large break in the uveal tract and sclera, with a mass of cicatricial tissue extending from the sclera to the lens, evidently the region of the injury. The retina is entirely detached and is fixed to this cicatrix which surrounds the lens.

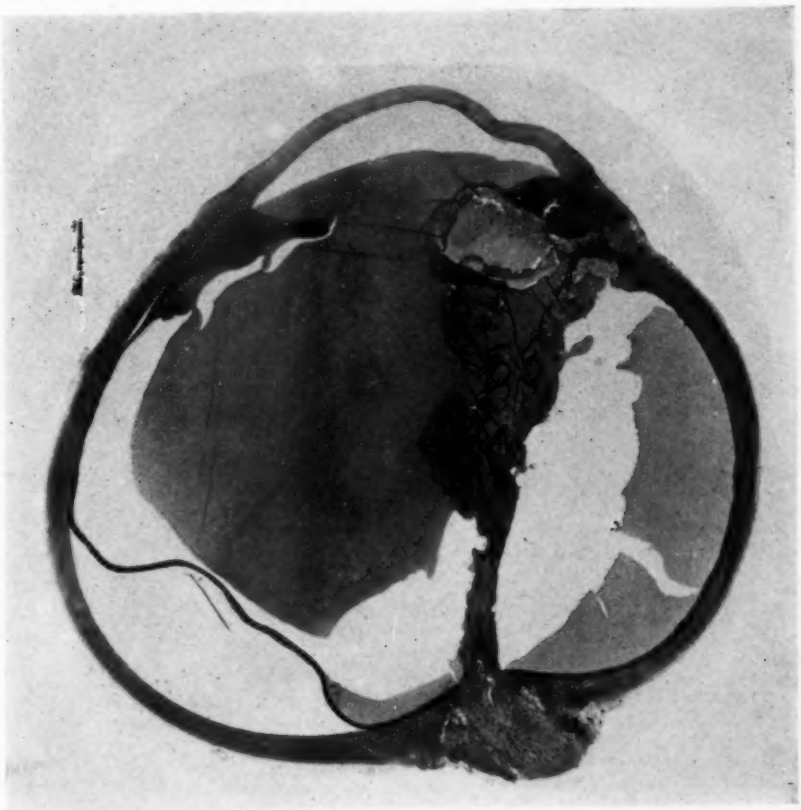

Fig. 1 (Martin). Anterior dialysis of the retina (case 1).

The optic nerve is completely atrophic on the nasal side, but there are still some medullated fibers present on the temporal side.

The retina is degenerated and attached to the ora serrata only on the nasal side. On the temporal side there is a large break, so that the subretinal

space and the anterior chamber are continuous with each other.

Summary: As the result of injury there was a wound in the lower nasal part of the sclera extending through the orbiculus ciliaris. This injury produced an endophthalmitis and, as a consequence, cataract and shrinking of the lens, with the formation of a band or cyclitic membrane which by

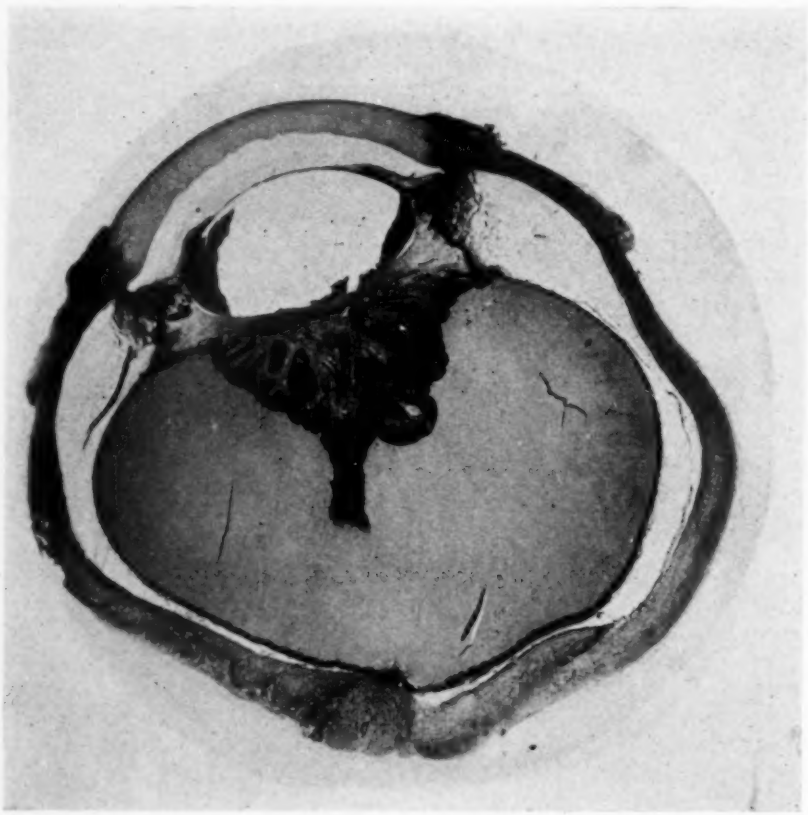

Fig. 2 (Martin). Posterior dialysis of the retina (case 2). (Low power.)

its shrinking had dislocated the lens to the nasal side and also torn away the retina from the ora serrata on the temporal side to a large degree. It is impossible to say that the injury may not have produced dislocation of the lens, but from the specimen we can infer that this was due to the shrinkage, and likewise as to the break at the ora serrata.

Subsequently the injury produced sympathetic inflammation, the uveal tract showing everywhere the characteristic tuberculoid infiltration.

Case 2: Posterior dialysis of the retina. A woman aged thirty-four years had been treated seven years before for detachment of the retina of the left eye. Three months before admission she was struck in the right eye with a piece of wood.

Examination of the right eye showed a complete grayish-white opacity of the cornea, which was stained with blood pigment. The anterior chamber contained blood and the deeper parts could not be seen. The tension was increased and there was no perception of light. Because of pain the eye was enucleated.

The left eye showed a myopia of ten to twelve diopters, with myopic changes in the fundus and a retinal detachment below.

Histological examination shows the globe to be larger than normal (axial myopia), and the anterior segment presents nothing unusual.

The retina is highly degenerated, detached and folded, situated in the anterior half of the globe near the equator, and free of any connection with the disc.

On the inner surface of the choroid, next to the optic nerve, is a formation of cicatricial tissue mixed with tubular or gland-like prolongations of pigment epithelium, which constitutes, with the nerve head, a flat prominence at the place of the papilla.

The optic nerve is fairly normal. The lamina cribrosa can be made out on the temporal half of the disc. It is not correctly shown on the nasal half, but the intraocular portion of the nerve-head (the portion lying in front of the lamina cribrosa) is present only in part.

The break goes through the papilla, taking in not only the retina but part of the papilla, and this place is now covered with cicatricial tissue. This indicates that the tear took place in the living eye.

Summary: The enucleated eye undoubtedly had a predisposition to retinal detachment on account of myopia. Myopic detachment was present in the other eye.

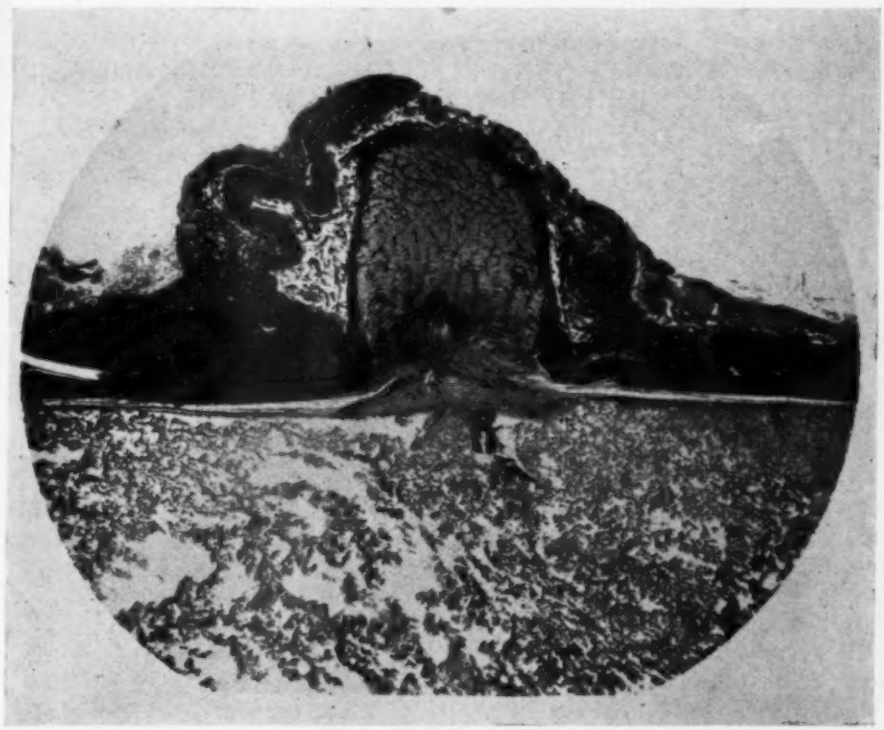

Fig. 3 (Martin). Posterior dialysis of the retina (case 2). (High power.)

I wish to express my appreciation to Professor Salzmann for his aid and instruction and for his permission to report these cases.

478 Peachtree street

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A METHOD OF MAPPING SCOTOMATA WITH TANGENT SCREEN BY BINOCULAR FIXATION

ALFRED COWAN, M.D.
PHILADELPHIA
AND
MAURICE E. MARCOVE, M.D.
DENVER

The eye which is not being examined fixes an object placed on the corresponding side and seen through a mirror which is supported by the head rest and is at an angle of approximately forty-five degrees with the visual axis; while the test object for the eye under examination is placed upon a tangent screen directly in front of the patient and at the desired distance. By adjustment of the mirror the centers of the visual fields of the two eyes are made to coincide. From the department of physiological optics, Wills Hospital, Philadelphia. Read before the College of Physicians of Philadelphia, Section on Ophthalmology, April 18, 1929.

It is generally conceded that binocular fixation is the best and most accurate method of mapping out central field defects. Numerous ways and devices have been brought forward to this end, but the ordinary instruments for binocular fixation are all adapted to very short-distances, and require the interposition of either lenses or prisms before the eye undergoing examination.

It is proposed to show how, by the aid of a simple contrivance, binocular fixation can be obtained for scotometry with a tangent screen, at any distance, and without anything between the eye and the screen which might influence the result of the examination.

This method, while not new in principle, has never been developed to the point where it could be practically applied by the clinician. The principle —seen in the accompanying diagram —is merely a modification of the Wheatstone stereoscope. It differs from it, however, in that only one plane mirror (M) is used to project the image of an object (O′) placed to the side of the eye not being examined.

The eye under examination looks directly forward toward the tangent screen (SS), upon the center of which is inscribed an object (O). The object to the side is so reflected by the mirror that its image is projected straight ahead, and this reflected image and the object on the screen can be fused into a single figure when the arrangement is properly adjusted. The eye under examination sees only the tangent screen; the other eye sees only the card to the side. Thus, if one eye is affected with a central scotoma, fixation can be maintained by the other eye.

Any two objects that can be blended may be used. We use a circle drawn around the center of the tangent screen, and a cross for the object placed at the side. Both of these are

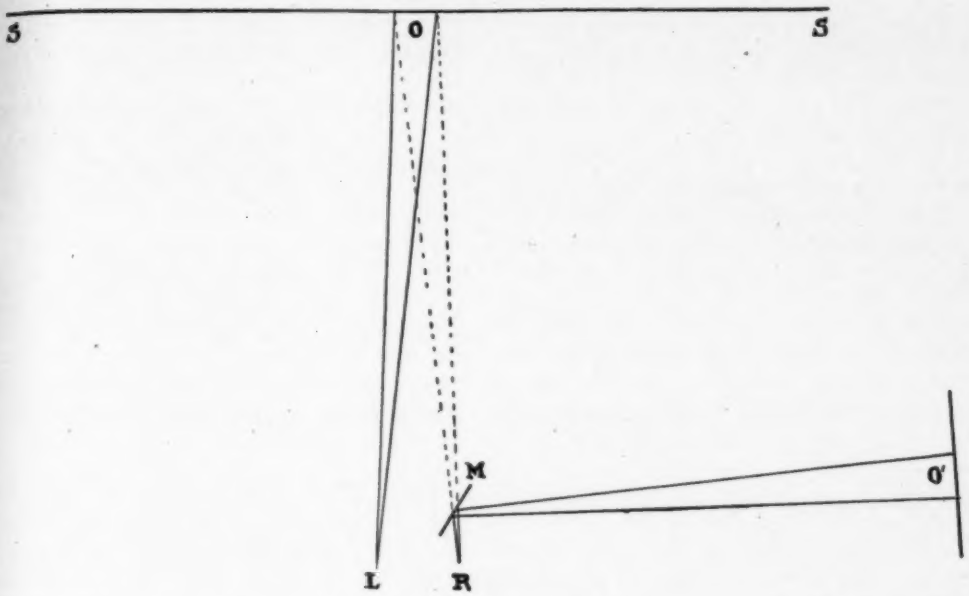

Fig. 1 (Cowan and Marcove). Mapping scotomata with tangent screen by binocular fixation.

drawn in black on neutral-gray Ferree and Rand paper. The illumination is so disposed that the chart viewed in the mirror is slightly brighter than the screen, in order to compensate for the loss of light by reflection. The arrangement is very flexible, and can be used at any desired distance. Muscular imbalances are compensated for by simply raising or lowering the instrument, or by changing the angle of the mirror.

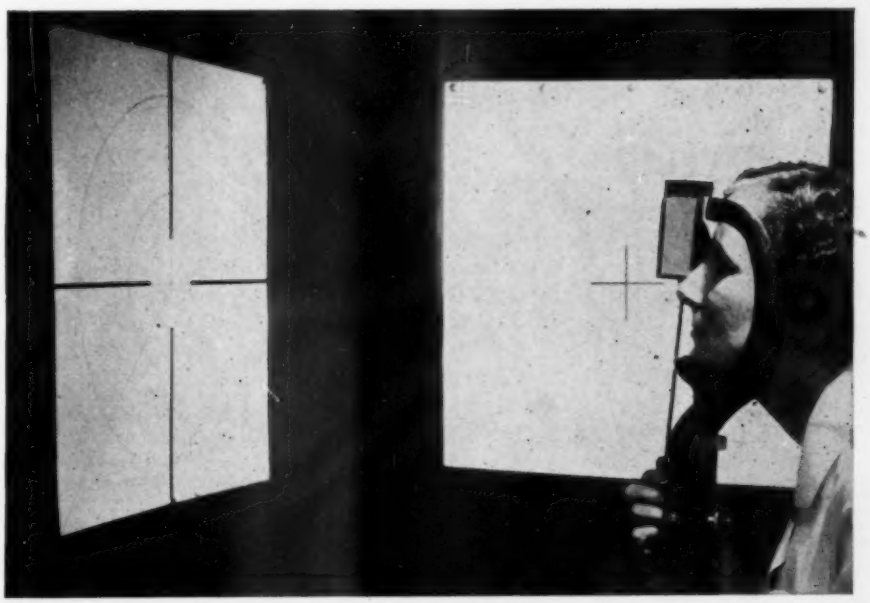

Fig. 2 (Cowan and Marcove). Mapping scotomata with tangent screen by binocular fixation.

Not only is this method useful for work in the central, paracentral, and blind spot regions, but the entire peripheral field as well can be explored with ease and accuracy.

It has been found in practice that it is extremely easy to instruct patients of ordinary intelligence to cooperate to the fullest extent, and without fatigue. The patient is placed before the screen at the elected distance, with the head fixed as comfortably as possible in a head- and chin-rest. If the field of the left eye is desired, the double-faced plane mirror, which is suspended from the horizontal crossbar of the head-rest, is rotated to an angle of approximately forty-five degrees before the right eye. The card containing the cross lines is so placed to the side of the right eye that the distance from the card to the mirror and thence to the eye is the same as the distance from the left eye to the screen in front. After the patient has been given the necessary instructions, he is asked to take hold of the handle of the mirror and keep it so adjusted that the left eye constantly perceives the circle about the point of fixation on the screen, while the right eye projects the image of the cross lines into the circle. The other eye is tested in the same way by rotating the mirror and placing the card on the opposite side.

The method described is inapplicable, of course, to patients possessing no fusion faculty, but for all others it has the following advantages:

1. Perfect fixation, even in the case of central scotoma, can be maintained by fusion.
2. The distance from the screen can be varied, enabling one to map the field at a half-meter, one meter, or two meters.
3. Nothing intervenes between the eye being examined and the screen. The whole field is included, since the mirror offers no obstruction whatever. The fault of most instruments in use at the present time is that the field is limited to the temporal side.
4. The instrument can be adjusted to conform to any muscle imbalance, either vertical or horizontal, by changing the position of the side object and the angle of the mirror.
5. The patient may be allowed to wear his ametropic correction.
6. The method is adaptable to the patient of average intelligence. The only instruction necessary to the patient is to keep the cross in the circle.

2007 Pine street, Philadelphia
526 Republic building, Denver

STUDIES IN PERIMETRY: 3, ERRORS OF REFRACTION, AGE, AND SEX IN RELATION TO SIZE OF THE FORM FIELD

C. E. FERREE, G. RAND,*

AND

M. M. MONROE†

BALTIMORE

Two hundred individuals were studied. Tables show, among other details, the frequency of occurrence of each group of size of field for each age group, the number of cases of each sex tested in the various refraction groups, and the average breadth of field in degrees for each group. It is concluded that errors of refraction are an important factor in variability of size of the form field from individual to individual, that after forty years age is also an important factor, and that sex is apparently not a factor of sufficient importance to take into account in diagnosis.

In former papers results were given to show the influence of variable factors in different types of study of the visual field, and apparatus and methods were described for the standardization and control of all the factors that were amenable to control by experimental methods. In the last two of these papers[1] a method of treatment of the remainder of the factors was outlined, namely those which vary from individual to individual; and preliminary data were presented for the formation of diagnostic scales for the form and color fields. It was also indicated in these papers that as fast as possible data would be given showing the influence of these factors on the size of the form and color fields. It is the purpose of the present paper to show the relation of three of them, errors of refraction, age, and sex, to the size of the form field for a stimulus subtending a visual angle of one degree. The influence of these factors can not be shown directly by experimental variation as was the case with the factors which vary for a given individual. The procedure used has been to collect the data under standard conditions of control for a group of nonpathological individuals, sampled to include the factors under investigation, and to determine the influence of these factors by statistical study so far as was possible in the situation presented. The results derived from such a procedure are not so clear-cut and incisive as are those obtained by the experimental method, but the procedure used is the only one available in cases in which experimental analysis is not possible.

The fields were taken on the Ferree-Rand perimeter, with strict observance of all the precautions prescribed for the use of this perimeter. With this instrument all of the external conditions of the test can be held constant and can be reproduced at will. The fields were determined with a white stimulus on a black background. The coefficients of reflection of stimulus and background were respectively seventy-eight and four per cent. The illumination at every point in the field was kept constant at seven foot-candles. The cases examined included private patients, doctors, nurses, assistants on the hospital staff, and a large number of clinic patients. In every instance the refractive condition of the eye was carefully determined and an ophthalmoscopic examination made. No cases showing a pathological condition, however slight, were included in the series. Ample rest periods were allowed between observations, and care was exercised that no field should be

* Research Laboratory of Physiological Optics, Wilmer Ophthalmological Institute, Johns Hopkins Medical School.

†Graduate School of Medicine, University of Pennsylvania. (Dr. Margaret Monroe Smith, Charlotte Eye, Ear, and Throat hospital, Charlotte, North Carolina.)

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taken when the observer was suffering from general fatigue or was otherwise unfit for accurate work. All determinations were carefully checked, but the observer was not given extensive preliminary training. It was not the purpose of the writers to make examinations for determining the influence of the factors in question under conditions differing in this respect from those which obtain in the ordinary practice of perimetry. The results obtained may, therefore, be considered a fair sample of the effects that may be expected in an average group of untrained observers who show no pathology.

Fields were determined in eight meridional quadrants (0, 45, 90, 135, 180, 225, 270, and 315 degrees). The eyes examined included seventy-five cases of hyperopia and hyperopic astigmatism, thirty cases of myopia and myopic astigmatism, forty cases of presbyopia, five cases of mixed astigmatism, and fifty cases showing no error of refraction or an error no greater than one diopter of hyperopia or a quarter diopter of hyperopic astigmatism. This latter group contained no cases of myopia or myopic astigmatism of a detectable amount. For convenience of treatment it will be referred to as emmetropic. The observers ranged in age from eight to fifty-six years. There were eighty-four males and 116 females.

In making comparisons of the kind considered in this paper a single value or index is needed to represent size of field. Two types of index have been discussed and used in our former papers; the average extent or breadth of field in the eight meridional quadrants, and the area of field as measured with a planimeter on a map drawn to a predetermined scale. The former of these has been selected for use in the present paper.

The relation of errors of refraction to size of field has already been shown and discussed at some length in a previous paper. In the present paper the relation is shown in the form of frequency curves for each type of error of refraction, similar in principle to the distribution curve. These curves are given in figure 1.

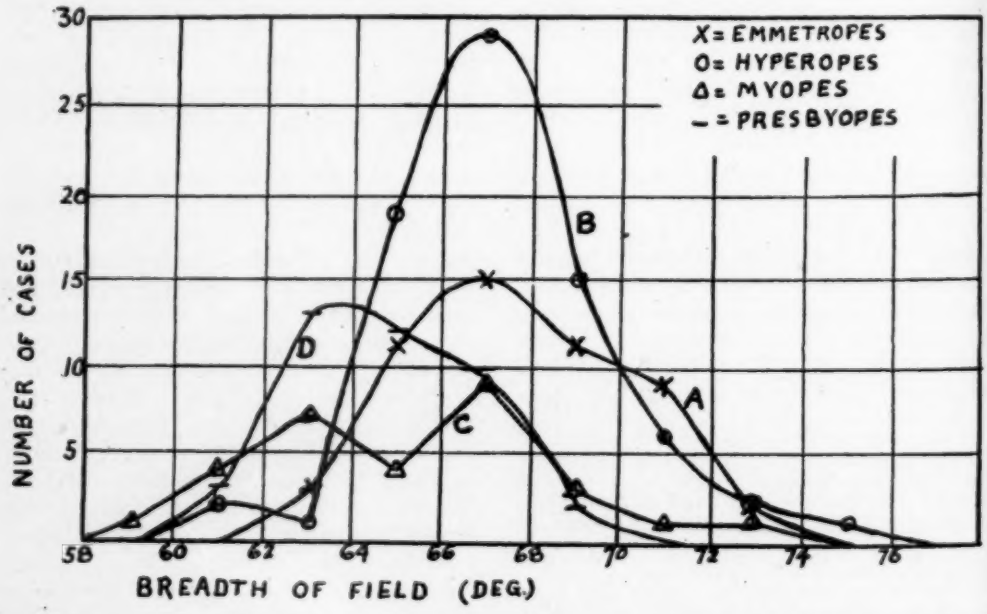


Fig. 1. (Ferree, Rand, and Monroe). Showing the distribution of the 200 nonpathological cases for each refraction group: A, emmetropes; B, hyperopes; C, myopes; D, presbyopes. The distributions are based on average breadth of field in the eight principal meridional quadrants.

In these curves average breadth of field in the eight meridional quadrants, expressed in degrees, is plotted on the horizontal coordinate, and number of cases on the vertical coordinate. The type of error of refraction is designated by a key shown in the plot.

In the consideration of these graphs the question of causes of relation between error of refraction and size of field naturally arises. The following possibilities are suggested:

(a) Indistinctness of the image in the more extreme cases of refraction defect. The consideration of this possibility for the cases in question is complicated, however, by lack of knowledge of the refraction situation for the peripheral hyperopia due to deficient curvature of the cornea one might expect as a phenomenon of refraction that the image for a given excentricity of stimulus in the field would be formed nearer to the center of the retina than for the same position of the stimulus in cases of emmetropia and myopia. The tendency of this factor would be to widen the field for hyperopia. Conversely, in cases of myopia due to excessive curvature of the cornea one might expect for portions of the field. In our more detailed and scientific work in the study of the peripheral field we have been accustomed to determine its refraction. In a study of the kind made here such a detailed specification of condition of refraction was quite impossible.

(b) The placement of the image on the retina. For example, in cases of a given excentricity of the stimulus in the field that the image would be formed relatively farther from the center of the retina. The influence of this factor would tend to narrow the field in myopia.

(c) Characteristic differences in shape of eyeball, in the degree of development and sensitivity of the nervous structure and in the health of the eye.

(d) Age as a dominant factor in presbyopia.

With the exception of (d) the data presented in the paper do not justify any serious attempt at a differential evaluation of the possibilities suggested. It may be noted, however, that the sizes of field obtained in the greater number of cases of hyperopia and myopia are in the direction that might

Table 1

SHOWING, FOR EACH AGE GROUP, THE NUMBER OF CASES IN EACH RANGE OF SIZE OF FORM FIELD

	Range of breadth of form field					
Age	58-61.9	62-65.9	66-69.9	70-73.9	74-77.9	Total
0- 9			1			1
10-19		14	28	5		47
20-29	4	19	36	12	1	72
30-39	2	10	17	4		33
40-49	4	16	10			30
50-59		14	3			17
Total	10	73	95	21	1	200

Table 2

SHOWING, FOR EACH AGE GROUP, THE PERCENTAGE OF CASES IN EACH RANGE OF SIZE OF FORM FIELD

	Range of breadth of form field					
Age	58-61.9	62-65.9	66-69.9	70-73.9	74-77.9	Total
0- 9			0.5			0.5
10-19		7.0	14.0	2.5		23.5
20-29	2.0	9.5	18.0	6.0	0.5	36.0
30-39	1.0	5.0	8.5	2.0		16.5
40-49	2.0	8.0	5.0			15.0
50-59		7.0	1.5			8.5
Total	5.0	36.5	47.5	10.5	0.5	100

be expected from the factor of curvature of cornea.

Tables 1 and 2 have been compiled to show the relation between age and average breadth of form field in the eight principal quadrants. The range of size of field is treated in five groups of four degrees each, the range of age in years in six groups of ten years each. The rows of table 1 show the frequency of occurrence of each group of size of field for each age group; while the columns show the frequency of occurrence of each age group for each size of field. In table 2 is shown the percentage of occurrence of each group of size of field for each age group.

Inspection of these tables indicates that there is some tendency for size of field and age to vary concomitantly, the larger fields occurring at the younger ages. The coefficient of correlation between age and size of field computed by the product-moment formula of Pearson for linear relationship is -0.31 ± 0.04.[2] The table shows, however, a slight nonlinearity of relationship due to a pronounced shift towards smaller fields near forty years of age. That is, above forty years the mode (the value on the scale that occurs most frequently) falls in the group 66 to 69.9 degrees (average 68), while below forty years the mode falls in the group 62 to 65.9 degrees (average 64). Between thirty and forty years a transitional stage is seen where there is more nearly an equal number of cases in the groups whose averages are respectively 68 and 64.

This shift of the mode downward at forty years of age and the transitional stage between thirty and forty years will be shown in a later paper to occur also for the color fields. The average size of field for the age group ten to nineteen is 67.0 degrees; for the age group twenty to twenty-nine is 67.5 degrees; for the age group thirty to thirty-nine is 66.8 degrees; for the age group forty to forty-nine is 64.8 degrees; and for the age group fifty to fifty-nine is 64.7 degrees.

In figure 2 the data have been plotted to show separately the distribution of cases below and above forty years of age. Curve A gives the distribution of the 153 cases below forty years of age; curve B the distribution of the forty-seven cases above forty years of age. For ease of comparison the data for curve B have been replotted in curve C on a magnified scale. The factor of magnification used was 3.25, the ratio of the number of cases in the two groups.

It may further be noted that no very large fields (more than seventy degrees) occur above the age of forty and no very small fields (less than sixty-two degrees) below the age of twenty years. These characteristics are also in general found for the color as well as for the form fields.

The narrower fields of the presbyopic group are probably largely a phenomenon of age rather than an effect of presbyopia. That is, presbyopia, the loss of sensitivity, and the general failure of all the powers of the eye are in the main coordinate rather than interdependent phenomena of age. However, in the more advanced cases of presbyopia the defective focusing for close vision, due to loss of accommodation, doubtless exerts a direct influence on the results of perimetry when the stimulus is viewed at a distance of 33 cm. Other age phenomena, extraneous

[2] For the benefit of nonstatistical readers, the following brief note of explanation is appended: The Pearson product-moment formula is the accepted statistical procedure for computing an index which represents the degree of correspondence existing between two variables. Perfect positive correlation is indicated by +1, that is, large values of the one variable correspond to large values of the other; perfect negative correlation is indicated by —1, that is, small values of the one variable correspond to large values of the other; lack of correlation is indicated by 0. The coefficient of correlation of —0.31 found above shows that there is a tendency for large values of size of field to occur with small values of age, and conversely. The probable error ± 0.04 indicates that the chances are even that the true value of the coefficient of correlation lies within the limits -0.31 ± 0.04. That is, with other samples of unselected nonpathological subjects, the chances are that the coefficient of correlation between age and size of form field would fall between —0.27 and —0.35.

to the functional changes in the sensory mechanism, which may exert an influence on the perimetric results are opacities of the cornea, lens, and vitreous; changes in size of pupil; and so on.

The results have further been studied to show what relation, if any, exists between sex and the size of the form field. The 200 cases studied included 84 males and 116 females. The median value of size of field rated in terms of average breadth is 66.4 degrees. For degrees; for the females 66.75 degrees.

Table 3 gives the number of cases of each sex tested in the various refraction groups and the average breadth of field in degrees for each group. It is seen that the averages for the females are slightly but consistently larger than for the males in each group. The difference is too small to be significant in diagnosis, but it presents a possible point for further study. Whether it represents an actual difference in spread of sensitivity is problematic.

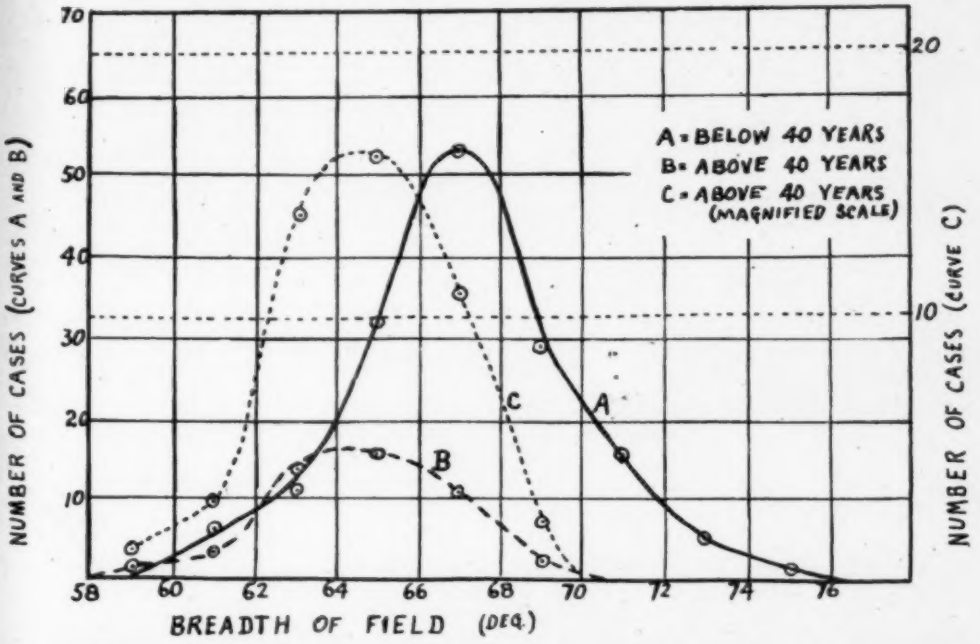


Fig. 2. (Ferree, Rand, and Monroe). Showing for comparison the distribution of the nonpathological cases below and above forty years of age. In curve A are represented the 153 cases below forty years of age; in curve B the 47 cases above forty years of age; and in curve C the cases above forty years plotted on a magnified scale, the factor of magnification being 3.25, the ratio of the number of cases in the two age groups. The distributions are based on the average breadth of field in the eight principal meridional quadrants.

the males the average breadth of field for thirty-six cases, or forty-three per cent of the number tested, falls above and for forty-eight cases, or fifty-seven per cent of the number tested, below this value. For the females, the average breadth of field for sixty-four cases, or 55 per cent of the number tested, falls above and for fifty-two cases, or forty-five per cent of the number tested, below this value. The average breadth of field for the males is 66.04

The result may be due to other causes. Among these may be mentioned differences in facial conformation: the deeper set eyes, the more prominent nose, the overhanging brows, and so on of the males. Some information as to the importance of the factor could be obtained perhaps from a study of the fields for the two sexes meridian by meridian. Sex differences and their analyses will be made the subject of more extensive study should the data

Table 3

SHOWING THE NUMBER OF CASES OF EACH SEX STUDIED IN EACH REFRACTION GROUP AND THE AVERAGE BREADTH OF FIELD

Refraction group	Sex	Number of cases	Average breadth of field (degrees)
Emmetropia	M	22	67.42
	F	28	67.73
Hyperopia	M	28	66.42
	F	47	67.54
Myopia	M	12	64.98
	F	18	65.25
Presbyopia	M	17	64.54
	F	23	65.09
Mixed astigmatism	M	5	65.50
	F	0	
Entire Group	M	84	66.04
	F	116	66.75

obtained in later work show that the point is of sufficient importance.[3]

[3] In this connection the following quotation taken from a letter written to one of the writers by Dr. Henry H. Donaldson of the Wistar Institute of Anatomy and Biology under date of March 26, 1926, is suggestive: "In studying the albino rat we have found the eye bulbs of the female to be heavier than those of the male of like body weight, and the area of the cross section of the optic nerve to be also greater in the female. This last would possibly suggest a slightly greater extension of the retina in the female."

Conclusions may be stated as follows: (1) Errors of refraction are an important factor influencing variability of size of the form field from individual to individual. (2) After forty years age is also an important factor; while earlier than this the effect of age is negligible. (3) Sex is apparently not a factor of sufficient importance to be taken into account in diagnosis.

Wilmer Ophthalmological Institute

NOTES, CASES, INSTRUMENTS

MELANOTIC MIXED CELL SARCOMA OF CHOROID

L. L. McCoy, M.D.
SEATTLE

Swedish laborer seen January 19, 1929, at the Seattle Eye, Ear, Nose and Throat infirmary. The patient was being treated at the Swedish hospital for a gastrointestinal disturbance. His physician said he had been under antiluetic treatment for many months, during which time the vision in his left eye had gradually failed until practically none remained. At his first visit he could only distinguish light and dark eccentrically. He had been examined by an eye, ear, nose, and throat specialist three months previously and had been told he had a simple detachment of the retina. The patient was somewhat unbalanced mentally, consequently his personal history was not very trustworthy.

Examination: A rather pale, somewhat undernourished, medium-sized male forty-eight years of age, queer in speech and action. Right eye under careful scrutiny was normal except for Argyll Robertson pupil; vision 20/15—. Left eye, vision hand

movements; Argyll Robertson pupil; mild conjunctival congestion; otherwise normal externally. Under mydriasis the lens was clear. There was a large retinal detachment below and nasally very strongly indicative of new growth in the upper nasal quadrant, as there seemed to be a more or less circumscribed elevated gray area in this locality, darker than in the surrounding detachment. Transillumination showed a definite shadow in the pupillary area as light was moved over the upper nasal quadrant. The disc could not be seen. Tension, by fingers, was normal.

Since this patient had been under intensive antiluetic treatment for a long period, it was assumed the eye condition could not be of a luetic nature such as gumma, so he was advised to have his eye enucleated at once. Dr. Walter F. Hoffman of this clinic examined the case and concurred with me as to diagnosis and treatment. The patient's physician was asked concerning the possibility of the gastrointestinal trouble being due to new growth, and we were instructed that there was no evidence of such growth, the condition being undoubtedly luetic gastric crises. The physician also informed us that the patient's physical condition showed no contraindication to the operation being done under general anesthesia.

Operation: The enucleation was performed under general anesthesia at the Swedish hospital, on January 25, 1929. The conjunctiva was sutured with silk and a firm dressing applied. The patient made an uneventful recovery. He will be kept under observation indefinitely.

Pathological report: The specimen was sent to Major George R. Callender, U. S. Army Medical museum, Washington, D.C., for study and report. The essential details of the report follow:

Gross description: There is a sessile pigmented tumor which arises from the nasal side and projects about one cm. into the posterior chamber, the base being about six mm. from the disc and eight mm. long. The outer rim of the lens is white and opaque.

Microscopic: Melanotic sarcoma, largely spindle cell in character, arises just behind the equator and extends into the posterior chamber, pushing the retina before it; accumulation of exudate behind the retina, which is attached at the ora serrata; slight depression of the lamina cribrosa; edema of the iris, which with lens projects forward into the anterior chamber, the iris pressing against the posterior surface of the cornea, adhesions being evident on one side of the sections examined.

Diagnosis: Melanotic spindle-cell sarcoma of the choroid, secondary glaucoma.

817 Summit avenue.

THE TREATMENT OF INCIPIENT CATARACT

THOMAS HALL SHASTID, M.D., F.A.C.S.
DULUTH, MINNESOTA

In the abstract department of the April Journal I note Dr. Beigelman's account of Lasareff's "A new cataract theory". The theory is that, as the aged lens increases in size, the ciliary processes contact the lens equator and thus produce more or less disintegration of the capsule. A minute but persistent absorption of aqueous follows, and then comes cataract.

This, for years, has been my own theory of the production of senile cataract. I am not writing to claim priority, since priority should always date from the time of publication, and I have never published a word on the subject before this. I write now only to confirm, as far as I can, Dr. Lasareff's view.

For years I have treated incipient cataracts, and by almost innumerable methods, always, of course, with very varying results. Sometimes the results could fairly be termed brilliant. In every case, however, I have proceeded largely on what turns out to be Lasareff's hypothesis.

Here is the way in which that hy-

pothesis is linked up with my treatment.

As a person gets old, not only does his lens increase in size, but it always becomes much stiffer—harder to bend and thus to make more convex. This condition is known to us all as "presbyopia". Now, if the patient goes too long without having his presbyopic correction brought down to date, what happens? The ciliary muscle, which is stronger even than it is in youth, cramps close down on the lens in the attempt to force upon it an increased convexity. Whatsoever one's pet theory of accommodation may be, I do not think there can exist the slightest doubt of this increased contraction of the muscle when a case of presbyopia is even slightly undercorrected. The result of the undue contraction is, once again, an increased contact of ciliary processes on lens capsule, minute traumata, and frequently incipient cataract.

As a natural consequence I have for years, in all such cases, attempted to protect the lens from further trauma by slightly overcorrecting the presbyopia, say by a quarter of a diopter, or, if the patient bears his overcorrection well, by a half. Always the patient should be instructed to read and to do all other near work not up close where the muscle will again be set into contraction, but at about his customary reading distance. In other words he should be caused to read, write, and so on at a point where the letters are just a trifle blurred. To express the matter another way, if a person's customary reading point is thirteen inches, overcorrect him slightly and have him still read at thirteen inches. After a time he becomes accustomed to the trifling blur and then can, as a rule, read far longer with comfort under just that little blur than formerly he was able to do with perfectly clear-cut vision.

If the internal recti seem to rebel at this arrangement, a very slight decentration of one of the lenses inward will give all the relief necessary. As a rule, however, decentration is not required, because if the patient really continues to work at his customary near point no unusual demands are made on his in-pulling muscles.

In numerous cases I have had patients with complete absence of accommodative power and with incipient cataracts use for near +3.50 D.—the full correction at thirteen inches of course amounting to only +3.00 D. I may add that +3.25 D. is almost always easily borne.

In a number of cases I have given no other treatment for incipient cataract than just this moderate overcorrection, or relaxation, of the muscle, in order that I might be able to tell whether or not any good results could come, or could appear to come, from this one unmixed therapeutic measure. In a considerable number of instances the results were plainly and remarkably good. Sometimes the lens has, from aqueous absorption, already rendered the plus of the spectacle lens excessive. This excessive plus I do not reduce unless it amounts to more than half a diopter. In reducing I invariably leave that much in excess of the theoretical requirement—I mean in these cases of early cataract in which the lens has swollen.

An intelligent patient, capable of full cooperation in the plan, is of course presupposed. No intelligence, no slight blur in reading—and no results.

629 East First street

A PECULIAR TYPE OF CATARACT

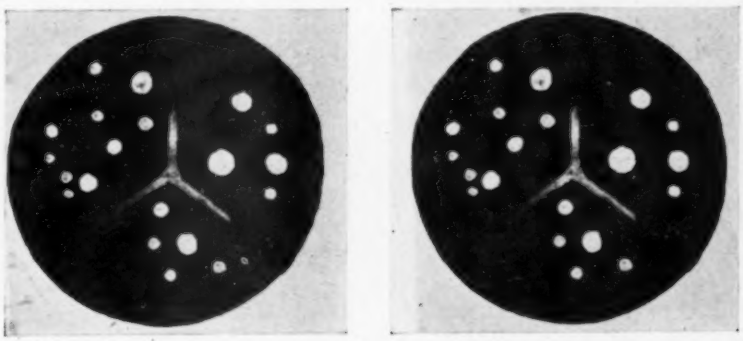
LT.-COL. R. E. WRIGHT, M.D., C.I.E., I.M.S.

MADRAS, INDIA

On November 21, 1928, two Hindu sisters, Thayar aged eight and Pushpa aged three years, were brought to the hospital by their mother for cataract. There was a third child in the family, younger than Pushpa, whose lenses were clear. The father and mother were also normal in this respect.

The elder girl showed shrunken membranous cataractous lenses on

either side, of a type not uncommon here, in which irregular dense white curdy deposits were situated under a thickened capsule; the remainder of the flattened capsular bag being filled with a fluid resembling well watered milk. She had nystagmus, and her vision was hand movements in either eye. The anterior capsule was incised carefully with a needle, and the contents washed out through a small linear incision made at the side of the needle puncture—a usual procedure here, known as "linear" with irrigation evacuation. She got clear vertical apertures, but vision could only be brought to fingers at four inches. The eye grounds looked normal.



Peculiar type of cataract (Wright). Stereoscopic view (see footnote).

The younger sister showed a much more interesting condition; and amongst the large variety of juvenile cataracts which I have seen here it was quite new to me, nor could I find anything suggestive in the literature at my disposal, which, however, is limited. In the right eye there was a uniform gray lenticular opacification reaching right up to the capsule. In the left, which at first sight looked normal, there was a series of minute opaque dots in the lens. With the corneal microscope these presented a beautiful appearance, as of a number of spherules of crushed ice, of different sizes, suspended at various heights and levels, but all being situated between the Y figures. My attempts to depict these appearances were rather unsuccessful, and I have not been able to produce anything better than the accompanying "faked" stereophotograph of a semidiagrammatic black and white drawing. However, it gives a better idea of the condition than any other picture which I could have produced here.*

The child was kept under observation and put on an adequate diet which included small doses of cod liver oil. There was no suggestion of deficiency, nothing abnormal about the teeth, nor in connection with the ordinary processes of calcification. In fact there was nothing whatever to shed light on the etiology of the cataract, both the children and the mother showing negative syphilis and tuberculosis tests and normal urinary constituents. At the beginning of February, 1929, the routine examination with the corneal microscope showed that opacification had started in the left eye in the lental zones outside the anterior Y figure.

By February 25 the opacification

* Colonel Wright sends the following explanation of the trick employed to produce a stereoscopic effect:

"I made several drawings of the spherules in white on a black background, giving them their relative position with reference to the posterior Y figure, and then, on superimposed pieces of glass, painted in the more anterior of them so as to overlie those on the flat drawing. The photograph taken of this combination produced a stereoscopic effect as nearly suggestive of the condition as anything which I could arrange without the help of an artist accustomed to corneal microscope work."

was right up to the anterior capsule. At this time the cortex showed numerous large bubble-like spaces with a granular opacification between.

On March 12, 1929, a "linear" and curette evacuation was performed. This latter procedure was adopted in order to collect all the lens matter possible, including the spherules. This was successfully accomplished and subsequently the remaining opaque lens matter was evacuated with the irrigator.

The largest of the spherules was examined under the binocular microscope. It presented an irregular mulberry-like surface, and was semitranslucent. Some opaque lens fibrils were adherent to it; but these were brushed off with a camel-hair brush; and thereafter it was explored with needles and was found to be hard and gritty. On attempting to cut it, it slipped from beneath the cutting edge of the needle with the sharp noise of steel slipping on a stony surface. Eventually the spherule was cut clean in two, or rather fractured under the pressure of the cutting edge. The cut surface was apparently plane and reflected light evenly.

The appearance of the hemispheres under the binocular microscope reminded one rather of minute naphthalene balls, but was not quite so opaque. The diameter of the largest of the spherules was 0.4 mm., and measurement of several of the larger spherules showed them to range between 0.2 and 0.4 mm. There were many much smaller than this; I counted fifteen, but there were others embedded in lens material which were not teased out. The cut spherule slowly changed color on keeping and eventually became brown.

There was an excellent operative result on either side, with clear central pupillary apertures, and the child had good vision when she was taken away from the hospital.

The following is a report on the constitution of the spherules found in the lens, by Dr. W. K. K. Christie, Geological Survey of India, Calcutta:

"From the anomalous (spherulitic) extinction between crossed nicols, the material is cryptocrystalline and is probably made up of very small elongated crystals, radiating from the centers of the spheres. The elongated individual crystals may be uniaxial with the length parallel to the optic axis, or biaxial with the length parallel to one of the three axes of the optical ellipsoid.

"One of the hemispheres was washed with water and treated with dilute hydrochloric acid; a brisk effervescence was noted. The residue was still hemispherical, but its diameter was reduced by more than half; the color changed from dirty yellow to pale brown, and the anomalous (spherulitic) extinction was no longer visible on examination between crossed nicols. The material dissolved was presumably calcite arranged as radially disposed needles; this formed some seven-eighths of the mass.

"An attempt was made to find the melting point of the residual hemisphere. It showed, however, no signs of change in shape when heated to 176 degrees C.; its color became slightly darker.

"Hydrochloric acid (about one part of concentrated acid to one part of water) dissolved the residue completely on heating under pressure to 165 degrees C., giving a yellow solution. The solution was treated with an excess of ammonia; no precipitate was visible, but a brown stain on the inner side of the tube probably indicated a small quantity of iron.

"On addition of ammonium oxalate a white precipitate was found, indicating the presence of calcium. Phosphate was not found. The residue possibly consisted of the calcium salt of an organic acid."

Government Ophthalmic hospital

SOCIETY PROCEEDINGS

Edited by Dr. Lawrence T. Post

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology

February 8, 1929

Mr. Cyril Walker, president

Pituitary tumor treated by x-rays

Mr. Griffith showed charts of the fields of vision of a man aged forty-eight years, who in 1925 had had vague difficulty with reading and later began to have headaches, giddiness, and staggering. In March, 1926, he had central bitemporal scotomas. Central vision was 6/6, and remained so. At a consultation it was advised that the tumor be operated upon. Declining this, the man went to Paris, where he had x-ray therapy on twenty-six occasions. Before the first course was finished, the patient had lost his headache and giddiness. The fields had improved and now they were almost normal. With delicate methods, it was found that recovery was not quite so perfect. A method which revealed defects not otherwise discoverable was by the use of a red object. The red fields charted on the previous day showed central scotoma similar to the original ones for white. Mr. Griffith did not wish to be understood as advocating x-ray treatment of all pituitary enlargement cases. If after irradiation a case needed operation, the fibrosis would render the operation more difficult. But when operation was refused brilliant results could sometimes be obtained by x-rays.

Discussion. Mr. Davenport referred to two cases of the kind in which very great improvement had followed the use of x-rays, even though they were applied three years and five respectively after the condition was established.

Spontaneous filtering scar

Mr. McCallan showed a case of this character. The patient had served in the South African war. He appeared to have a trephine wound, but stated that he had never had an operation, nor had been examined by an ophthalmic surgeon. At one time he had done a good deal of boxing, and probably he had then sustained injury to the eye, which he had now forgotten. It might have caused rupture of the globe and produced the condition now to be seen.

Discussion. The president recalled the case of a man, supposed to be malingering, who had come with papilledema. He died, and at the post-mortem he was found to have two and one-half inches of a pen and wooden holder embedded in his left frontal lobe. Yet no history of injury could be gleaned during life.

Tumor of the iris

Mr. McCallan showed the case of a boy, eight years of age, who was said to have had a red, swollen eye for a week. Keratitis punctata and nodular swellings of the iris were present. There was a whitish reflex at one spot. The vision was less than 6/60, that of the other eye being normal. The growth might have been tuberculous, gliomatous, or possibly lymphosarcoma.

Discussion. The president said that a case similar in appearance had proved on microscopical examination to be sarcoma. On a colleague's advice the eye was enucleated.

Complete hyaloid artery

Mr. Wittington showed a boy aged eleven years. The lens was comparatively clear, vision 6/24 with a plus six lens. With the slit-lamp one saw a complete vessel with its branches, and the hyaloid sheath fading off in the vitreous.

Discussion. Miss Ida Mann said that a partially persistent hyaloid was com-

mon, but she had never seen such a beautiful example of arrest of development as this. The appearance corresponded to development at the sixth month, with very few changes.

Late results in iridocyclitis after ultraviolet rays

Mr. J. F. Cunningham showed a patient who had been before the Section in 1925, as one of the first two cases in which ultraviolet rays had been used by general application for iridocyclitis. For two years the eyes had been practically quiet, except for attacks of bullous keratitis. Keeping up treatment with liquid paraffin drops had, he thought, helped to prevent recurrence of the bullæ.

Hemangioma of the cerebral meninges

Mr. R. Foster Moore described the case of a boy aged twelve years, who was seen on account of defective vision in the left eye. The parents were anxious as to whether the right eye was likely to be affected. In 1925 his visual acuity with a small hypermetropic and astigmatic correction was 6/9 in the right eye and 6/12 in the left. The left eye had become worse during the last year. The father was said to have been blind from locomotor ataxia. The boy was healthy looking, and made complaint only of his left eye. There was a nevus of the left half of the face, involving the eyelids. The left eye reacted poorly to light, and the visual acuity of the right with correction was 6/9, and of the left 6/6. There was slight congenital dislocation of the lenses and a small coloboma of the left optic disc. He had an incomplete right homonymous hemianopsia.

As to the cause of the lesion, in the absence of any of the common or likely causes such as cerebral tumor or abscess or vascular disease, and having regard to the nevus of his face and the condition of the eyes, Mr. Moore thought the likeliest cause was a nevus of the visual cortex, and had two skiagrams of the skull taken to see whether they would provide fresh evidence. These, which were shown, disclosed a tumor composed of large vessels, the walls of which seemed to be calcified and greatly thickened.

Discussion. Dr. Parkes Weber discussed the paper and spoke of a similar case of his own. In the latter there was unilateral buphthalmos, and in the buphthalmic eye the patient was blind. There was congenital spastic hemiplegia of the face, and the extent of the cutaneous hemangioma was shown in a photograph. The patient had sexual infantilism, and a skiagram was taken to see what the base of the skull was like. The cerebellum was free. In eight cases of the kind published there was unilateral buphthalmos on the affected side.

Mr. Leslie Paton said that at the present time Mr. Williamson-Noble, Dr. Greenlees, and he were investigating a case of Lindau's disease, and he referred to another case of that condition, a girl, who had had acute glaucoma and tremendous hemorrhage, and whose eye had had to be removed. The girl had definite intracranial symptoms, and was operated on for cerebral tumor. Unfortunately, the operation was a supratentorial one, whereas the angiomatosis in these cases was almost entirely subtentorial. The question was whether the last-named region should now be operated on, a grave decision to take.

Report on retinal glioma

Mr. R. Foster Moore and Mr. Scott read a paper based on two infants who were suffering from bilateral glioma of the retina. The growth was very small in each patient. In no case should both eyes of such patients be removed at the same time; but a thorough examination of both eyes should be made under a general anesthetic. If consent to removal of the eye was withheld by the parents, radium might well be tried.

Iridodialysis of pigment layer of iris.

Mr. Basil Graves read a short paper and gave an epidiascopic demonstration on this subject. Transscleral il-

lumination was a form of effectual and intense retroillumination. It might be shown that the translucent stroma of the iris was very slightly obstructive to the passage of light—negligibly so in comparison with the posterior pigment layer of the iris. The speaker had over some years collected evidence tending to show that detachment of the posterior pigment layer of the iris from the anterior pigment layer, by injury or by pathological changes, was by no means uncommon. The tendency to the reopening of this embryonic potential space was even greater, probably, than the tendency to the analogous occurrence further back in the eye, namely detachment of the neural retina from the retinal pigment layer.

The posterior pigment layer of the iris possessed mechanical properties in accordance with the contractile and expansile function of the iris. The author considered that, whereas the thin anterior layer of pigment was very intimately and inseparably associated with the mesodermal stroma, the thick posterior layer was a structural entity which was ductile to a certain necessary degree but was inelastic; that is, it would stretch to a certain limit, but would not do this by virtue of any property of its own, but only because of its attachment to tissue containing muscle, and would then return to its initial form after it had been subjected to expansion or contraction.

Transscleral illumination applied in a routine manner to all classes of cases over some years had revealed a definite condition resulting from concussion injury which was clinically detectable by no other means, namely, iridodialysis of the posterior pigment layer of the iris, the anterior pigment layer and the stroma remaining intact. When the condition was found it might be of value in medicolegal cases where the question of injury was in dispute. Certain lesions simulated the condition, but they were readily distinguishable after a little experience. It would have been easy to coin a term for this condition, such as "melanodialysis" or "epidialysis" (the tissue involved being derived from neural epiblast), as distinct, say, from "mesodialysis", though the author had never found a case in which the mesodermal stroma had alone been thus affected without implication of the pigment layer also, and when the mechanical properties of the stroma and pigment layers were considered, he thought it improbable that this would occur from injury. Melanodialysis, or epidialysis, combined with theoretical mesodialysis, together comprised the ordinary traumatic iridodialysis.

(Reported by H. Dickinson)

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology

March 8, 1929

MR. CYRIL WALKER, President

Cholesterin crystals in the anterior chamber

For MR. CARDELL, Mr. P. G. Doyne showed a case of this kind. He said the patient was first seen in 1923. There was a history of lodgment of a foreign body, and the x-rays gave a positive appearance, but the magnet was ineffectual in removing it. The case was only seen comparatively recently, and the eye had now become very painful.

Melanosis of the eyeball

MR. CUNNINGHAM showed a patient with this condition who had not obeyed the advice given eighteen months ago to attend hospital, and now the general opinion of members was that the eye must be removed. The speaker intended first to remove the fleshy mass and have it examined.

Discussion. SIR WILLIAM LISTER spoke of a somewhat similar case in which the condition had spread into the substance of the cornea, finally necessitating removal of the eyeball. He asked whether any members had seen such cases go on to sarcoma. Nearly al-

ways removal of the eye took place before sarcoma occurred.

MR. DOYNE spoke of a case which had begun in 1918, in which he thought radium was used originally. A small fleshy lump had been excised and the patient was sent to the Radium Institute in 1923. A year ago she came up on account of suddenly failing sight and the eye had to be removed. There had been in this case a long latent period, followed by a bad course.

MR. PICKARD thought the case might be attacked by diathermy, which might be safer than a cutting operation, and less likely to be followed by recurrence.

MR. J. H. FISHER thought the same considerations applied to pigmented moles elsewhere in the body.

MR. SHATTOCK thought no man should allow a pigmented mole to remain in his body after his fortieth year. It would have been very unwise not to remove a pigmented mole on the eyeball.

The PRESIDENT referred to a similar case of his own, in which there was a nodule on the lid. The growth was obviously increasing. It was reported that the removed portion was definitely sarcomatous. At the meeting at which it was shown Colonel Lister felt sure it would become malignant. The speaker took away all the pigmented area, including of course the eyeball, conjunctiva, and lid, and the year since this was done had been free from recurrence.

Melanoma of the choroid

MR. FRANK JULER showed a case in which this condition was discovered during examination of the fundus when the patient came for glasses. He had not yet examined for scotoma.

Discussion. MR. REA spoke of a case of his own with a large patch on the temporal side of the retina with eleven satellites around it, with no diminution in the field of vision: it had remained so for four years.

Rodent ulcer of the lid

MR. JULER also showed a case in which there had been a swelling of the upper lid for twenty-one months. There had been an increase in the last six weeks. He had received ample confirmation of the nature of the case at the meeting. The question he raised was as to whether excision should be done, or radium or other agent applied. He rather favored the use of radium, as the deformity would then be less than after excision.

Discussion. MR. O. G. MORGAN spoke of a case of the same kind in which cure by radium had taken a long time. If a rodent ulcer was free from periosteum and mucous membrane and could be removed, it was much better for this to be done straightway.

MR. E. R. CHAMBERS spoke of a case of this nature which had completely healed under radium four months ago, and in which so far there had been no evidence of recurrence.

Perforating wound of the eyeball

MR. HUMPHRY NEAME showed a case in which there was a small prolapse of the iris. The piece of wood which caused the injury had in it a nail projecting three-fourths of an inch; the man did not know whether the point of the nail had hit the eye, but the speaker thought it likely. He asked whether it would be safer to leave him alone or to try to free the prolapse. In the latter event there would be a risk of pulling the ciliary body into the wound.

Discussion. MR. JULER suggested dissecting down the conjunctiva, turning down the flap, and getting hold of the iris tissue which was projecting.

MR. B. CRIDLAND, who had seen a number of such cases, usually snipped off the prominent tissue and covered the perforation with conjunctiva.

MR. FISHER spoke of using the galvanocautery to burn the pigmented tissue away, then covering with a flap of conjunctiva.

SIR WILLIAM LISTER said much depended on the stage at which one had the chance of operating. If within a

fortnight, there was a good possibility of freeing the iris by a simple operation.

Optic atrophy after arteriosclerosis, with papilledema

MR. NEAME also showed a case of swelling of four diopters in each eye. There were abundant retinal hemorrhages, venous engorgement, and a very marked arteriosclerosis in the retina. The general blood pressure was high. There was found to be only slight defect of renal function. Wassermann was negative. This age, thirty-five years, was unusually young for such a degree of arteriosclerosis. There was now marked improvement. Formerly the man had had only perception of shadows in each eye; the left vision had now improved to 6/18; there was no improvement in the right eye.

Pigmentary degeneration of retina

MR. E. WOLFF showed a woman aged fifty-seven years who had come to the hospital complaining of defective near vision; for ten years she had had difficulty in seeing at night. The periphery of the fundus was like that of ordinary retinitis pigmentosa. Vision went to 6/9. The whole of the lower part of each fundus was speckled with cholesterin crystals. Though the Wassermann was negative, a bad family history suggested that the trouble was syphilis.

Discussion. The PRESIDENT said this seemed to him to be secondary to definite choroiditis.

Congenital dislocation of both lenses upward

MR. WOLFF showed a patient who said that a number of his relatives had bad eyes. Mr. Wolff had not been able to examine the relatives. The slit-lamp showed the fibers of the suspensory ligament running to the lens.

Discussion. MR. REA referred to a case in which both lenses were dislocated, in a woman whose daughter had the same condition. The mother was operated upon, but from the result, he had decided not to operate on the daughter.

Reported by H. Dickinson

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

February 19, 1929

DR. W. HOLBROOK LOWELL presiding

Extreme hypermetropia, microphthalmia, and glaucoma

DR. EDWIN B. DUNPHY presented a male Italian, forty years of age, who had come into the clinic on January 30, 1929, complaining of failing vision. The first thing noticed was a nystagmus. The eyes were very small, the anterior chambers very shallow. Each cornea measured ten mm. in both vertical and horizontal diameters. In order to look into the fundus it was necessary to use a + 18 to + 20 sphere; the highest case of hypermetropia he had ever seen. The tension reading was about 40 mm. in each eye. The vision was reduced to about 20/200 in the left eye and about 4/200 in the right eye. Fields were difficult to obtain. The right disc was deeply cupped, and the left disc showed beginning cupping. Iridotasis operation on both eyes reduced the tension to normal. It was very difficult to take the tension in this case because the eyes were so small. The Schiøtz tonometer did not fit the corneal curve, so a Souter tonometer was used.

DR. EDWIN B. DUNPHY presented a woman, sixty-eight years of age, who had come into the clinic January 30, 1929, complaining of failing vision in the right eye. Vision of right eye was 20/100. The eye was normal except for an immature cataract. The field was perfectly normal. In the left eye, however, she showed a primary optic atrophy with thread-like retinal arteries: there was a history of sudden loss of vision in this eye following grippe thirty years ago. Dr. Dunphy made a diagnosis of optic atrophy due to an old embolus. The color of the retina was now normal. A neuro-

logical examination, including Wassermann, was negative. There had not been any history of heart disease.

Chronic purulent conjunctivitis from infecting prothesis

Dr. W. D. Rowland presented F. F., printer, aged thirty-eight years, who had complained September 8, 1928, of a continuous mucopurulent discharge from the left socket. This eye had been enucleated years ago because of a burn. Examination showed the prothesis floating in at least a dram of mucopus. The infection seemed to be avirulent but had persisted over six months in spite of care by competent ophthalmologists. The right eye was not affected. After irrigation of the socket and an argyrol bath for fifteen minutes the prothesis was cleaned with mercuric iodide solution 1/5000 and reinserted. In spite of twenty percent argyrol for three weeks, then two percent mercurochrome for two weeks, and finally silver nitrate one percent for two weeks, discharge had persisted. On October 27, 1928, on holding the prothesis up to the light it appeared to be two-thirds full of fluid. It was a reformed type of prothesis which must have cracked and filled with conjunctival secretion.

A new prothesis was ordered and the old one sent to the laboratories for bacteriologic investigation. Within two weeks the conjunctivitis was almost entirely cleared up. Silver nitrate was continued occasionally. The last observation, about November 24, showed the socket clean, and the patient was wearing the new prothesis with entire satisfaction.

The laboratory reported that the fluid removed from the prothesis was clear, gave a faint reaction for albumen, and had no odor. Smears showed no organisms. Cultures showed staphylococcus aureus, staphylococcus albus, and a slight motile gram-negative bacillus classified as bacillus coli anaerogenes.

Discussion. Dr. Verhoeff described a similar case.

Gumma of the tear sac

Dr. Benjamin Sachs presented a twenty-eight-year old woman who had been treated for an acute dacryocystitis for several weeks. On admission there was a firm indurated mass in the region of the left tear sac measuring about 1 by 1.5 cm. and extending toward the middle of the lower lid. The skin over it was discolored. It was only slightly tender to pressure. Fluid could be syringed easily through the sac into the nose. X-rays of the sinuses were taken and also a blood Wassermann. The left antrum was found to be infected but was thought to have no relation to the disturbance in the region of the tear sac. The blood Wassermann was positive. After administration of potassium iodide the mass almost completely disappeared. The past and family histories of the patient were essentially negative. The diagnosis was thought to be gumma of the tear sac.

Discussion. Dr. George S. Derby mentioned a case, similar to Dr. Sachs's, which he had reported some four or five years ago. A comparatively young woman with a mass in the region of the tear sac complained of more or less epiphora. The duct had been probed a number of times with rather unfortunate results. The swelling grew larger until finally the symptoms became more acute. It was thought that it was possibly due to lues. A Wassermann was taken and was strongly positive. Under antiluetic treatment the swelling and symptoms entirely subsided.

Congenital tortuosity of retinal vessels

Dr. Mark Anthony presented a seven-year-old boy who had come into the out-patient department one year ago because of poor vision. He had a convergent squint in the right eye. Under atropin he took + 2. sphere + 2.50 cyl. ax. 90° for each eye. The fundus of the right eye showed marked tortuosity of both arteries and veins. Between the disc and the macula was a depressed greyish-white area.

Head tilting: vomiting reflex with head erect

DR. JAMES J. REGAN presented a boy of eight years, mentally retarded (hypopituitary type), with a moderate hypermetropia (plus 1.75 D. in each eye), an alternating divergent squint, and head tilting to the left. The mother stated that when he held his head upright "something came up in his throat". When his head was held upright for the purpose of testing the extrinsic ocular muscles he vomited almost immediately. Each attempt to hold the head erect induced the same gastric reflex. On fasting also he vomited whenever the head was held erect. He was shown because of this interesting reflex and to excite discussion as to its probable cause.

Ocular lesions caused by intracranial hemorrhage

DR. ALEXANDER MACDONALD read a paper on this subject.

S. JUDD BEACH,
Secretary

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section on Ophthalmology

February 21, 1929

DR. WILLIAM ZENTMAYER,
acting chairman

Pulsating exophthalmos

DR. GEORGE SCHWARTZKOPF of Atlantic City (by invitation) presented a case of pulsating exophthalmos of the left eye due to traumatic aneurism into the cavernous sinus. The case had been under his observation for almost two years. Surgical intervention had been impossible due to the bad general condition of the fifty-five-year-old female patient.

The exophthalmos appeared four weeks after a severe automobile injury with fracture of the upper jaw, extending to the vault of the hard palate. The treatment was symptomatic and the digital-compression which was tried for three weeks was not well borne. Nevertheless the condition improved amazingly. Temporary high tension of the left eye had to be relieved by cyclodialysis, as miotics did not relieve the pressure.

In the first year after the accident, the exophthalmos and the typical symptoms of bruit, tortuous conjunctival and retinal veins, thin arteries, and retinal hemorrhages varied, as well as the subjective feeling. Diplopia with esophoria existed for about one month but vanished spontaneously without recurrence.

The patient was now feeling well, did all housework, and had no complaints, except that colds seemed to cause slight increase of congestion in both about equally prominent eyes. Pulsation and bruit were distinct, the latter being observed by the patient only if her attention was called to it.

Bilateral tuberculous choroiditis

DR. ABNER R. RENNINGER (by invitation) presented a girl, ten years of age, with history of rapid failure of vision in the right eye. She was first seen January 14, 1929, with vision reduced to 3/200. Ophthalmoscopy revealed a crescent-shaped, grayish-white, elevated area to the temporal side of the disc. In a few days there was general choroidal edema, dust-like opacities in the vitreous, and deposits on the back of the cornea. Nineteen days later the left eye (which had been normal to this time) became involved in an identical way. The vision, however, did not fall below 20/70.

A complete medical examination was made and the only positive findings were the tuberculin reaction and the presence of a calcification in the left chest. Treatment consisted of biweekly injections of tuberculin, mercurial inunctions, and increasing doses of potassium iodide.

The subsequent history to date was that the choroidal edema had entirely disappeared from both eye grounds. There remained, however, in each eye several oval white patches which were located near the margins of large

retinal vessels. The vision in the right eye had not improved. In the left it had been restored to 20/40 plus.

Discussion. Dr. Edward A. Shumway said that he had seen the child in consultation with Dr. Renninger, had made a diagnosis of acute plastic juxtapapillary choroiditis in the right eye, and had advised sending her to the hospital for examination. The left eye subsequently became involved, and the process rapidly advanced in both eyes. Recently the appearance of scattered yellowish-white areas gleaming through the retinal edema had made the diagnosis of a tuberculous choroiditis practically certain, especially as all laboratory examinations had proved negative with the exception of the tuberculin skin test, which was strongly positive. Dr. Shumway spoke of the two types of tuberculosis of the choroid, the miliary and the conglomerate. Dr. Shumway showed with the projection lantern a number of microscopic slides illustrating this condition both in the choroid and in the iris.

Schilder's disease

Dr. Frederic H. Leavitt (by invitation) said that during the past few years a disease process involving the subcortical tissues of the brain and occurring principally in young children and characterized by blindness had been described in the literature. Paul Schilder of Leipsic in his original monograph in 1912 had defined the condition as "a diffuse disease of the white matter of the hemispheres occurring in childhood, which, because of the characteristic macroscopic and microscopic findings, may be regarded as a disease entity." Several writers before and since the publication of his article had described conditions occurring in children which were very similar as to the clinical picture and the pathological findings. Virchow had first described this syndrome in 1867, under the caption "congenital interstitial encephalitis," while as late as December, 1928, Globus and Strauss had written taking exception to the term "Schilder's disease" and advocating the name "degenerative subcortical encephalopathy."

The disease was fatal, and there was only a slight tendency to remission. The majority of cases were rather abrupt in onset and ran a rather rapidly progressive course. Blindness, with or without atrophy, varying degrees of coma, increasing generalized spasticity with opisthotonos, and decerebrate rigidity and myoclonic convulsive attacks made up the clinical picture.

The brains of patients dying with this condition revealed a general shrinking of the entire brain. Microscopical examination revealed intense degeneration of the white fiber tracts. This destructive process frequently began in the occipital lobes, accounting for the appearance of early blindness with no demonstrable changes in the eye-grounds. Occasionally optic atrophy occurred, secondary to the destruction of the visual centers.

The case presented was in a mulatto male, four years of age. There was a history of gastrointestinal upset followed by two weeks of apparent recovery and then a rather rapidly developing syndrome characterized by disturbance of gait (cellular ataxia), increasing coma, myoclonic rhythmic convulsive seizures, increasing blindness with negative eye-grounds, dysphagia, decerebrate rigidity with opisthotonos and normal temperature, and the usual spinal fluid findings, electrical reactions, and blood picture. This patient was still living at the Children's hospital in Philadelphia, and because of the resemblance of the condition to acute multiple sclerosis he had been treated by intravenous injections of "germanine" every four days. The only improvement noted from this therapy had been the disappearance of the myoclonic convulsive attacks, the other characteristics of the clinical picture remaining as before.

Discussion. Dr. Shumway had examined the patient at the Children's hospital a number of times. During

the period that the child showed spasms of the face, the eyes also presented clonic movements, and at one time there was a definite conjugate deviation to the left. Because of the mental torpor, functional tests for vision were not possible, but the attending nurses reported a gradual failure of vision, noted in bringing food cups to him, and at present the child seemed practically blind. At no time had there been any fundus lesions. Dr. Shumway had also seen the second case reported by Dr. Leavitt, and the optic nerves in this patient showed atrophy.

Dr. Yaskin said that Schilder's disease resembled multiple sclerosis not only pathologically by the exclusive involvement of the white matter but also from an ophthalmologic standpoint. In both diseases the ophthalmologic examination revealed no cause for the blindness. Another interesting point about Schilder's disease was that it sometimes occurred rather suddenly with apoplectiform attacks, or again might resemble brain tumor, so that useless operations were known to have been performed because of failure to recognize this condition.

Spontaneous nystagmus

Dr. Joseph C. Yaskin (by invitation) said that for clinical purposes spontaneous nystagmus was divisible into labyrinthine, neurologic, and ocular types, based upon an etiologic relationship to anatomophysiological changes located respectively in the labyrinth and its vestibular projection, in the posterior longitudinal bundle and allied central structures, and in the optical fixation. A simple and rapid method for determining the type of spontaneous nystagmus, as suggested in the presentation, consisted of observing the type, direction, degree, frequency, amplitude, association, and permanency of the nystagmic movements. These observations, shown graphically in a table, rendered it possible to determine the origin of the nystagmus in a few moments. Another table showed the associated clinical findings in the three types of nystagmus. The high frequency of ocular nystagmus was stressed especially because it was the most benign type of nystagmus. The nature of diplopia occurring with nystagmus, independent of any extraocular muscle paresis, was discussed. The conclusion was that the diplopia under these conditions was due to rather serious involvement of the central nervous system.

A. G. Fewell,
Clerk.

LOS ANGELES COUNTY MEDICAL SOCIETY

March 4, 1929

H. S. Muckelston, president

Plastic operation on upper lid

Dr. LaMotte presented a colored man who had been severely burned in a gasoline explosion. The left eye had to be enucleated because of infection. The upper lid of the right eye was contracted up to the brow, exposing the cornea. The scar tissue was removed and the upper lid border sewn to the lower lid. A two-inch square Wolff graft from the arm was sewn into the defect. It was now one month since operation, and the adhesions produced between upper and lower lids were to be left in place until all contraction subsided.

Discussion. Dr. L. H. Wallendorf called attention to the fact that the Wolff graft must be much larger than the defect and that all subcutaneous tissue adherent to the graft must be removed.

Tumor in orbit

Dr. George McCoy showed a girl three years old in whom an exenteration of the left orbit with the cautery had been done, followed by radium therapy. In July the parents had noticed a white spot in the pupil. In August the eye was seen by a doctor who made the diagnosis of iridocyclitis with hypopyon. When first seen by Dr. McCoy the patient showed a pushing forward of the lids by a

tumor mass toward the nasal side of the orbit. It was difficult to make out the cornea and the eyeball was hard. The pathologist's report of the tumor mass was round-cell sarcoma. Dr. McCoy thought it more likely that the tumor was a glioma, as Ewing had stated that round-cell sarcoma and glioma had a somewhat similar appearance. It was also more likely that a tumor in a child of this age would be glioma, for Dr. McCoy was unable to find a case of round-cell sarcoma reported at this age. There was no pigment in the growth and there were no metastases. There was no evidence of glioma in the other eye. Attention was called to the reports by Fuchs of spontaneous regression of glioma in the second eye; and to reports of cures effected by Verhoeff and others with x-ray and radium.

Treatment of iris prolapse

DR. WILLIAM LUCAS presented a man who had been struck in the right eye with a wire. A laceration was produced at the limbus at the nine o'clock position with iris prolapse. Atropin used for three days had no effect on the prolapse. Three drops of amin-glaucosan were instilled and the prolapsed iris loosened with a repositor. The prolapse slipped back into the anterior chamber. Atropin was used the next day. The wound healed with no infection and the patient now had a round, normal appearing pupil.

Steel through globe into orbit

DR. WILLIAM LUCAS presented a man who had had a piece of steel enter the eye and pass through the lower portion of the iris and lens and through the posterior wall of the globe. The foreign body was localized three millimeters back of the eye in the orbit. With the giant magnet the steel was drawn back into the vitreous and then removed through a scleral incision. The patient did not develop a complete cataract but had only a small opacity in the lower portion of the lens. The visual acuity was normal.

Vitreous aspiration

DR. CLIFFORD WALKER gave a brief history of vitreous aspiration as practiced by Ford, Gradenigo, Zur Nedden and others. Zur Nedden's latest method was to remove vitreous from the center of the globe where it was more liquid, by means of special aspiration needles. A set of these was demonstrated. By animal experimentation it had been shown that small amounts of vitreous were regenerated. The needles were sterilized with 1 to 1500 mercury cyanide and then boiled. One patient had been seen who came in for enucleation because of pain. The eye was blind from an old injury and was undergoing degeneration. Dr. Walker aspirated one-half cubic centimeter of vitreous from the globe, after which it became quiet and did not bother the patient over a period of several months. The question was brought up as to whether the procedure might be made safe enough to be used before cataract extraction, to determine if the vitreous were fluid or not. This might be done by using a needle of suitable caliber.

Discussion. DR. WEYMANN asked as to possible bad late results of this procedure, such as retinal detachment and degenerative changes.

DR. GEORGE MCCOY stated that he thought that the underlying focal infection should be removed in order to cure vitreous disease rather than risk aspiration.

DR. LUCAS thought the danger of infection to be slight, because he had had only four infections following fifty-three intraocular foreign bodies last year.

DR. ROSENFIELD inquired why aspiration was better than removal of vitreous by posterior sclerotomy.

DR. WALKER answered that the great mass of Zur Nedden's work was too recent to draw conclusions as to the late results of the procedure, but that such accidents as retinal detachment, hemorrhage, and infection had been reported. Aspiration was better than sclerotomy because a greater amount of central fluid vitreous could be with-

drawn by aspiration with less risk. It was pointed out that the injuries of which Dr. Lucas spoke were to healthy eyes, where the danger of infection was less.

Scleral suture in cataract extraction

Dr. Clifford Walker used Carrel needles to place his sutures. In order to insure apposition of the wound the eye was fixed with a small two-pronged fork and the sutures inserted so that both needles of the double-armed suture entered the same hole, one being passed upward and the other downward. This meant that the incision must be accurately placed. Therefore it was made with a keratome and enlarged with scissors. A patient who was shown had vomited on the day following operation and had been struck in the eye one week later, but the wound had not opened. As the wound only developed tensile strength in four to seven days, the sutures, two or three in number, were left in place ten days.

M. F. Weymann,
Secretary.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

March 12, 1929

Dr. A. C. Lewis, presiding

Sympathetic ophthalmia following nonpenetrating wound

Dr. J. B. Stanford presented the case of J. McN., five years old, who had suffered from sympathetic ophthalmia in the right eye seven months after a nonpenetrating wound of the left eye. On June 1, 1928, the boy was struck in the left eye by a small stone. He was seen a few minutes later by Dr. Stanford, who found the cornea abraded, the pupil widely dilated, and much blood in the anterior chamber. The eye was treated with rest, atropin, and hot applications. More blood appeared in the anterior chamber and became dark. A few days later the tension became elevated but was reduced by the use of pilocarpin and dionin. Within four weeks the blood had been absorbed, leaving a greenish stain on the inner surface of the cornea. The eye became slightly soft and the injection was entirely gone on August 7. The child was not seen again until January 31, 1929, when he came complaining of pain in the left eye since about eleven o'clock the previous night. He had no recollection of having again injured the eye. The anterior chamber was filled with fresh blood. The other eye appeared normal to casual inspection. Atropin was applied and the boy was sent home to bed with directions to use hot applications. When he was seen on February 2, 1929, his right eye presented evidences of sympathetic ophthalmia: the eye was sensitive to light, there were deposits on the posterior surface of the cornea, the anterior chamber was cloudy, and the entire pupillary margin was adherent to the lens capsule. Dr. Anthony saw the case in consultation and agreed as to diagnosis and proposed treatment. The exciting eye was enucleated the same afternoon, and while the patient was under the anesthetic he was given five c.c. of his own blood serum intramuscularly. On February 4 he was given five c.c. of his whole blood. He was kept on atropin and was given sodium salicylate. On February 9 the eye was free from injection and it had remained so. There was iris bombé and a film of old exudate on the lens capsule.

Discussion. Dr. E. C. Ellett had never seen a case of sympathetic opthalmia from a nonpenetrating wound. This case, however, with the quick sealing of the iris to the lens and the instant response to surgery, certainly was typical of this condition. He was gratified to see an apparent response to blood serum therapy, as he had never been satisfied with this treatment in his own practice.

Dr. J. B. Stanford did not know what caused the improvement. The boy was on salicylates to the point of tolerance, but because of the rapid response he thought the blood serum

had helped. The original injury was an abrasion, not a perforation, and the left eye had been inspected only casually because the possibility of sympathetic trouble was not even considered. The injured eye was blind and should have been removed early, but had been saved in deference to the wishes of the parents.

Follicular conjunctivitis

DR. J. B. STANFORD presented the case of J.B., five years old, in whom he had diagnosed follicular conjunctivitis of an extreme degree. The conjunctiva of all lids and of the caruncles was covered by rounded follicles.

Discussion. DR. R. O. RYCHENER had under treatment a case of follicular conjunctivitis even more marked than this. Coxcombs of follicles, as big as one's little finger, lay in both upper and lower fornices. One eye had been treated with radium without result, but several applications of x-ray had caused the granulations to melt away. The other eye had been kept as a control and the patient would be shown later.

DR. A. C. LEWIS had noticed an enlargement of the posterior cervical glands and thought most of these cases had an associated generalized lymphoid hyperplasia. He advised the syrup of iron iodide.

DR. J. B. STANFORD stated that he had advised x-ray therapy, but the parents had objected.

Congenital cataract

DR. J. B. STANFORD presented the case of E.McC., one year old, on whom he had operated for congenital cataracts by needling. Each eye was operated on three times, the last operation being for membranous cataract. The baby was given for the left eye + 10.00 sphere which he wore very satisfactorily in a frame made especially for him.

Ball and others advised in selected cases ordinary extraction in infants. He would not attempt such technique. The change in the child since operation had been amazing.

Anophthalmus

DR. THOMAS (by invitation) presented A.R., colored female, aged seven weeks, who had not opened the eyes since birth. Under chloroform anesthesia, examination had revealed complete absence of both globes. There was in each eye a central fissure which resembled a healed purse string closure following enucleation. No rudimentary stalk could be palpated. The conjunctivæ appeared normal.

Central choroiditis

DR. E. D. WATKINS showed B. B., aged thirty-two years, who had first come to the dispensary August 22, 1927, complaining of a film over her left eye for the past four days. The onset had been sudden. External examination was negative. The right vision was 20/20—, left eye 20/200. Pupil reactions, tension, and lacrimal sacs were normal. Ophthalmoscopic examination under homatropin showed black pigment spots close to the macula. All tests including the tuberculin reaction were negative.

For three months the eye was studied under atropin, and dionin was prescribed. December 13, 1927, the patient stated she could see as well as ever. Visual test that day showed left eye 20/20. There was no change in the appearance of the spots from the first time they were seen.

Discussion. DR. E. C. ELLETT thought the lesion more retinal than choroidal. The primary condition must have been edema of the macula, and the vision had returned as soon as the edema subsided. This probably was not recognized at the time. Many changes in the macula were seen which had an unsatisfactory explanation. It was always difficult to exclude tuberculosis. He did not believe much in the focal infection theory of the cause of chorioretinal lesions, but thought the four major causes were senility, myopia, lues, and tuberculosis.

DR. J. B. STANFORD, had called these lesions tuberculous after eliminating all other causes.

DR. A. C. LEWIS had seen a school

teacher, forty years old, with central chorioretinitis that he thought due to focal infection. The vision was returning after removal of several dead teeth.

DR. R. O. RYCHENER stated that the size of the lesion had no bearing on the loss of vision, and cited a case under observation in which the ophthalmoscopic picture showed total destruction of the macula due to chorioretinitis in one eye and the vision was 20/20, while in the other the macula was apparently only slightly involved and the vision was 20/100.

DR. WATKINS had seen a similar case previously in which the pigment had a green tinge, and the vision was 20/200. He had given a bad prognosis and then later found the vision improved.

Epithelioma at the limbus

DR. E. C. ELLETT reported the case of Mr. P. L., aged fifty-nine years, who was seen in November, 1927, with the history that a piece of steel had lodged in the left eye thirty years earlier and had been removed by Dr. Savage of Nashville ten years later. According to the patient's story, there was a small red spot at the temporal limbus and Dr. Savage told him there was a small piece of steel in the tissue he removed. There was a slow recurrence of the growth, which was removed in 1925 by Dr. Ramsey of Jonesboro. Then there was a rapid recurrence which was removed twice by surgery, once by fulguration, and once by x-ray. Examination of the tissue was said to show that it was malignant. There was a small hard granulation at the outer limbus, surrounded by a zone of corneal infiltrate. X-ray treatment was advised and was given for about a month with apparently slight improvement. The growth was then removed by incising on the corneal side and taking off enough tissue to include all the growth. The defect was covered with a conjunctival flap and the patient was given further x-ray treatment December 29, 1927. The diagnosis made by Dr. Fleming was melanotic carcinoma. About three weeks after the operation the eye was found to be perfectly well, but six months later a small, flat, round papule was seen at the site of the growth. This had undergone no change since that time. About September a swelling was noticed in the left side of the neck. About December 1, it was as large as a hen's egg. Some of the tissue was removed surgically. The swelling had immediately increased and the patient was now under x-ray treatment. The eye looked exactly as it had done last August. The section of the tumor from the neck was diagnosed as melanotic sarcoma.

Enucleation for choroidal sarcoma: metastasis eighteen years later

DR. E. C. ELLETT presented the case of Mr. T.B., who was seen in 1911 for loss of vision in the left eye. A diagnosis of intraocular tumor was made, and the eye was enucleated in May of that year. The section showed a small spindle-cell sarcoma of the choroid. The patient was seen three years afterward and as there was no trouble at all he was told to report if he had any further complaint. Within the last few months he had developed an abdominal growth and he had died in March, 1929. The autopsy showed a large melanotic sarcoma with invasion of the vertebræ and ribs. Microscopic sections from both cases were exhibited.

Albinism

DR. J. B. STANFORD reported a case of albinism in T.M., seven months old. The parents had noticed nothing peculiar about the child's eyes until he had developed a convergent strabismus about two weeks before. There was a pink reflex from the irides as well as from the pupils. Lateral nystagmus was present, and also an alternating convergent strabismus. The refraction as measured by the ophthalmoscope was —2. D and the fundus picture was that of an albino. The hair and skin were quite white.

The mother and father were apparently normal but rather blond.

Mature senile cataract, secondary glaucoma, and dislocation

DR. D. H. ANTHONY reported the case of G.M., male aged sixty-seven years, carpenter and builder, who was seen first on April 24, 1928. For three weeks he had noticed headaches above the left eye, which in the last three days had become painful. Vision had been hand movements with the left eye for eight years. The lids were slightly swollen, the conjunctiva showed a slight circumcorneal injection, the cornea was clear. The anterior chamber was of normal depth, the iris was dark brown without evidence of any congestion. The pupil was normal in size and active to light. Ophthalmoscopic examination showed the lens opaque, no fundus reflex (cataract). Tension felt one plus to finger test.

April 25, 1928, with the Gradle tonometer tension was O.D. 14 and O.S. 33 mm., and eserine was prescribed. The tension varied between 32 and 37 mm., and on May 1, 1928, a broad-based iridectomy was performed after the technique of Reese. May 2, 1928, the anterior chamber had reformed and a large coloboma resulted from the iridectomy. The pupil was dilated from atropin instilled after the operation. Eight days after the operation, in making an ophthalmoscopic examination, it was noticed that there was a slight reflex at the upper margin of the pupil. The following day the reflex was a little bit larger, and on the third day the fundus reflex had enlarged enough to tell that the lens was gradually dropping.

On June 5, 1928, extraction of the lens was accomplished, using a corneal suture. The speculum was held carefully away from the globe by the assistant, and the lens extracted in capsule with a loop. A small amount of vitreous was lost. The eye made an uneventful recovery. On September 5, 1928, with O.S. + 9.50 sph. + 1.00 cyl. ax. 180 degrees, vision equalled 20/15.

Hypopyon ulcer at site of incision for cataract extraction

DR. A. C. LEWIS reported the case of J.P.A., aged fifty-nine years, who had come complaining of severe pains in the right eye for nearly a week. Thirteen months earlier the speaker had operated on this eye for cataract and recovery was uneventful. As the patient still had 20/30 vision in the left eye, the right eye had been of little benefit to him. Examination showed a large deep ulcer at the twelve o'clock position on the limbus in the old extraction incision; it was beneath the conjunctiva at this point, and a considerable amount of pus lay in the anterior chamber.

The ulcer was burned out thoroughly with the actual cautery. Atropin, dionin, mercurochrome, and heat were prescribed. The ulcer healed promptly but the hypopyon did not absorb but solidified and contracted. When the patient left the city on March 10, the hypopyon appeared to be an organized exudate which would probably destroy all hope of a useful eye.

Conjunctival tumor at site of Elliot trephine operation

DR. A. C. LEWIS reported the case of D.J.K., aged seventy-three years, who had had a bilateral trephine operation for the relief of glaucoma simplex on May 15, 1926. On the day of operation tension was sixty-five and eighty-five mm. (McLain) and vision 20/100 and 20/60 in right and left eyes respectively. After operation vision in O.D. remained unchanged at 20/100, but O.S. improved to 20/50 + and had remained so to date. He had always had quite a large filtering bleb over each operative site, but the tension had remained around normal.

On February 18, 1929, the patient reported at the office for the first time in fifteen months, complaining of a growth on his left eye. A thick, white opaque tumor of the conjunctiva, so

large that the upper lid was held above it and could not close, was present. It was larger than a large English pea, quite tough, and almost snow-white. With no. 1 twisted silk the speaker had first ligated and then removed the tumor. This affected neither tension nor vision and one week after removal of the eye was in good condition. The mass was not examined microscopically.

R. O. RYCHENER,
Secretary

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

March 18, 1929

DR. HERSCHEL EZELL, chairman

Acute iritis

DR. M. M. CULLOM presented the case of W.F., white, male, aged fifteen years, a student, who had consulted him on November 17, 1928. On November 13, his eye had become inflamed, and he had suffered with pain and photophobia ever since. The pupil was small, the iris muddy. The patient gave a history of having had osteomyelitis of the left tibia five years before. The right antrum was dark by transillumination. He gave a history of having had tonsillitis in childhood. The tonsils were of the imbedded type. An x-ray picture disclosed cloudiness of the right antrum with evidence of polyps.

On November 20, Dr. Cullom had made a large window resection of the nasoantral wall under the inferior turbinate. Following the antrum operation, the eye showed very little improvement. Removal of the tonsils was advised. This was done under general anesthesia at St. Thomas' hospital, November 24. The left tonsil was the seat of a large abscess filled with foul smelling; cheesy pus. The afternoon of the operation the mother reported that the eye looked better. The next morning the eye was very much whiter, and it improved steadily during the next few days.

The interesting feature of this case was, that while the antrum had appeared to be the offending focus, being situated on the same side with the eye, it was evident that the real focus was the abscess in the tonsil. Many men had made the observation that infected tonsils were much more active foci of infection than infected sinuses. This case would seem to bear out that idea, though the speaker once had had a case of acute iritis that resisted the removal of infected tonsils and infected teeth but finally healed like magic after an infected antrum was drained. He was more and more convinced that the best means of relieving an acute iritis, nonspecific in character, was removal of the offending focus whenever found.

He had had cases of acute iritis from infected tonsils, from infected teeth, and from infected sinuses; and in each case removal of the offending focus had been followed by prompt clearing up of the iritis.

Discussion. DR. W. G. KENNON said that after removal of the focus of infection it was surprising how quickly the iritis disappeared. He thought that Dr. Cullom had done the right thing in clearing up the antrum first and then the tonsils. We were prone to search for something beside tonsils because we were so often accused of removing tonsils without cause. He felt that the tonsils before middle life was a more frequent source of infection than any other organ in the body.

W. W. WILKERSON, JR.,
Secretary

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CYLINDER SKIASCOPY AND CROSS CYLINDERS

The work of Lindner of Vienna in skiascopy with cylinders is a valuable addition to previous teaching of this objective method of estimating the refractive error of the eye, as laid down by Cuignet, Parent, Morton, Chibret, and especially Jackson, whose volume on skiascopy (1895 and subsequent editions) did much to obtain for this procedure its present-day popularity.

As still practiced by a large number of ophthalmologists, retinoscopy, skiascopy, or the shadow test is performed chiefly or entirely by means of spheres, the curvatures of the minimum and maximum meridians being neutralized with the respective spherical lenses; and the positions of these meridians being determined more or less vaguely by simple inspection.

But many of the best practitioners of retinoscopy have arrived at their results by combining the use of spherical and cylindrical lenses, as more particularly recommended in this country by Lambert, Jackson, and Duane.

Two years ago Lindner, who has had great experience in teaching his methods, published a volume entitled "The determination of astigmatism by means of the shadow test with cylinders" ("Die Bestimmung des Astigmatismus durch die Schattenprobe mit Cylindern"). In this volume, with appropriate illustrations, he elaborated extremely detailed instructions for estimating the strength of sphere and cylinder as well as the precise axis required. Incidentally he created a special terminology for various phenomena encountered and for the steps of the technique. Among the more important expressions employed are "adjustment angle," "hyperopic movement" and "myopic movement" (for movement with and against), "zero axis," "stationary and mobile astigmatism," "residual astigmatism," and "rotary astigmatism."

Lindner having devoted himself more particularly to statements of the subject which were comprehensible without a very intimate knowledge of mathematics, Krämer undertook to work out the purely theoretical aspect of the subject, and he in turn adopted a group of technical expressions for the various phenomena.

Raubitschek, of Tel-Aviv, Palestine, has recently offered a friendly criticism of the work of Lindner and Krämer, to the effect that in several respects these two earlier writers on cylinder skiascopy have employed like terms for opposite meanings; and to overcome this confusion of terminology Raubitschek proposes a unified system of his own.

Some of this confusion in terminology, and also, it may be said, much of the difficulty experienced by the student of cylinder skiascopy, arises from the fact that the net curvature of the refracting media of the eyeball which we correct with a convex cylinder is the flatter or relatively concave (that is, less convex) curvature of the eyeball, so that we are virtually dealing with a minus cylinder which is being corrected with a plus cylinder in the same axis. In correcting the myopic meridian of the eye with a concave cylinder, the converse relationship holds.

In spite of Lindner's enthusiasm for cylinder skiascopy as a scientific basis for refractive estimations, he insists that wherever possible this refinement of skiascopy must be checked by the subjective method, at the trial case. Furthermore, since publishing his volume on cylinder skiascopy, he has strongly urged the advantages of velonoskiascopy, a subjective method of which a description by Morsman was published recently in this Journal (1928, June, page 433).

In some cases retinoscopy or skiascopy is essential, because it is the only available means of obtaining a reasonably accurate estimation of the refractive error. On the other hand, in patients who are able to cooperate satisfactorily in a subjective test, it is never perfect practice to rely upon the retinoscopic test to the exclusion of the findings at the trial case and with the test letters.

However valuable, therefore, an accurate command of cylinder skiascopy may be, it is less essential to the welfare of the average patient than is the utmost possible refinement in methods of subjective testing, the results of which may, even in the hands of the most expert retinoscopist, show appreciable variation from the objective test, as to spherical correction, as to amount and axis of astigmatism, and as to the exact balance between the refractive errors of the two eyes.

To some remarks made by Stock at the London International Congress of 1913, Lindner attributes his own first appreciation of the fact that the behavior of the retinoscopic shadow with a cylinder at the wrong axis before the eye is dependent upon the laws of crossed cylinders. Both he who has difficulty in appreciating just what happens in using the cross cylinder test for the astigmatic axis, and he who is puzzled by the behavior of the cylinder inaccurately placed in retinoscopy, will derive profit from a few simple experiments with the cylindrical lenses of the trial case.

If two equal plus (or minus) cylinders are placed in optical contact so that their axes form an acute angle with one another, they will be found to have formed a new spherocylindrical combination whose axis is midway between the two primary axes. If similar but unequal cylinders are used, the new axis will lie between the two primary axes but nearer to the axis of the stronger cylinder. If a plus cylinder and a minus cylinder are placed in optical contact so that their respective axes form an acute angle with one another, a new spherocylindrical combination will be formed whose plus axis lies outside the acute angle in the direction corresponding to the primary plus axis, while the new minus axis will lie outside the acute angle in the direction corresponding to the primary minus axis. The displacement of the new plus or minus axis will depend

upon the relative strength of the two primary cylinders.

Upon these simple qualities of combined cylindrical lenses, demonstration of which is readily available to every refractionist, depends the technique of cylinder skiascopy, as well as each step of the manipulations of the subjective test for axis with the cross cylinder.

In studying cylinder skiascopy, the net astigmatism of the eyeball is to be considered as one cylinder, and the correcting cylinder as another, the axis of which is often, for the time being, inaccurately placed at an acute angle with the axis of the patient's astigmatism. Again, as pointed out above, it must be remembered that the curve of the eye which we are correcting with a plus cylinder is a relatively minus curve and therefore corresponds to a concave cylinder in the relationship just discussed; while the curve of the eye which we correct with a minus cylinder is a relatively plus curve and corresponds to a convex cylinder in the cylinder combinations just referred to.

Skillful use of the cross cylinder for subjectively testing the astigmatism, more particularly with regard to the axis, is often of greater value to the intelligent and cooperative patient than even the most skillful application of cylinder skiascopy, and would usually prove adequate without preliminary retinoscopic examination. But the wise ophthalmologist seeks to be expert in every available method of importance.

W. H. Crisp.

RADIUM FOR TRICHIASIS

The results of operations for the relief of trichiasis are often disappointing, and particularly so when the pernicious misdirection of the lashes involves only a part of the lid margin, or when the part of the lid involved has some lashes of normal direction and some which sweep the eyeball. Sometimes a limited group of lashes curves inward as the result of a small injury.

Patients with defects of this character are often elderly people who shrink from the thought of an operation, especially when it is impossible to give absolute assurance of a successful outcome. Hence they either learn to pluck their own eyelashes from time to time, or they are obliged to return at frequent intervals to the ophthalmic physician.

Electrolysis has been employed with some success for the destruction of limited groups of hair follicles on the lid margin, but this process is tedious, painful, and sometimes disappointing.

Several years ago, rather accidentally, the attention of the present writer was called by a dermatologic friend* to the fact that radium could be employed very successfully in cases of trichiasis. The dose of radiation necessary for permanent destruction of some or all of the lashes of an eyelid does not entail any other remote consequences of importance. These patients, usually elderly, have been accustomed to so much misery incidental to the incurving of the lashes that they are seldom distressed by the thought of permanent loss of a small group of eyelashes, or even of all the lashes of an eyelid.

In the few cases in which this treatment has been resorted to results have been prompt and permanent. For such cases the method seems to be superior to any other available; yet it does not appear to be generally known or to have found a place in ophthalmic literature. Hence mention of it here.

W. H. Crisp.

RISKS FROM PROTEIN THERAPY

Particularly in the use of new therapeutic methods, it is important to be on one's guard for any risks which they may involve. Injections of foreign protein for the treatment of various local conditions have become so frequent in the course of a few years that any careful review of the complications which have been encountered from this method is a desirable addition to medical literature.

* Dr. A. J. Markley, Denver. In conjunction with Dr. Melville Black, Dr. Markley had been using radium for vernal catarrh, and loss of eyelashes was striking as an unintentional result of such treatment.

Beigelman (California and Western Medicine, 1929, volume 30, page 404), after a wide experience with milk therapy, reports some interesting personal cases of incidental disturbance, and also assembles in a concise manner some leading features of the complications of this method as applied to ophthalmology, which have been recorded in the writings of others.

Undesirable local reactions in the form of infiltration, abcess, or hematoma are the result of faulty technique as to strict asepsis and as to avoidance of large blood vessels.

General shock of an alarming character has rarely occurred, although Darier reported a death twenty hours after an injection. The possibility of true anaphylaxis from milk and similar products has been denied, but there seems to be ample clinical evidence of its existence. Desensitization by Besredka's method is not always reliable, and Beigelman does not feel that the danger of anaphylaxis in protein therapy is sufficiently frequent and serious to justify sensitization tests in every case as advocated by Benedict.

Since the purpose of milk therapy is to stimulate a general and local reaction, it should be remembered that active response is not to be anticipated in a system which has been exhausted by age, disease, or malnutrition.

The significance of this fact was felt when milk injections were tried for the treatment of keratomalacia during the famine in eastern Europe a few years ago. The injections in these cases did not produce any general reaction, and were followed by prompt destruction of the degenerated cornea.

Since the local reaction from foreign protein injections consists of a primary exacerbation followed, in favorable cases, by decrease of the inflammatory disorder, corneal ulcers which are on the point of rupturing may do so more promptly after milk injections. Other undesirable reactions referred to in the literature include herpetic keratitis and aggravation of chronic uveitis, the latter sometimes complicated by secondary glaucoma. *W. H. Crisp.*

GOETHE'S PREJUDICE AGAINST SPECTACLES

In matters of human relationship and daily custom, even the most coldly logical of men and women are constantly swayed by prejudices which they have unconsciously acquired from their social environment, from the teachings of their ancestors and elders, and from the unreasoning influence of primary instincts.

To speak of poetic temperament may be to suggest that the color and quaintness of the poet's forms of self-expression are more than ordinarily subject to these whims and caprices, the more forcibly displayed because they are associated with superlative although eccentric intellectual vigor.

It is perhaps hardly strange that Goethe, the giant of German literature, who united within himself a passion for scientific investigation, a love of pageantry, extraordinary powers of self-expression in prose and poetry, and the egotism and masculine enterprise of a Beau Brummel or a Don Juan, should in his later years have manifested an outspoken and almost childish detestation for the wearing of eyeglasses or spectacles.

According to Greeff (from whom an address upon "Goethe and spectacles," delivered before the Berlin Society for History of Natural Sciences, Medicine, and Technique, is published in the Klinische Monatsblätter für Augenheilkunde, volume 82, page 389), the poet was from early life very shortsighted. This is illustrated by an incident in one of his youthful love affairs. When jealousy hurried him from his sickbed to a theatrical performance at which his sweetheart Käthchen Schünkopf was escorted by his rival, he was distracted to find that he had left his glasses at home and that from his seat in the gallery he was quite unable to view the maiden, who was in one of the boxes. Goethe's mother had been myopic, and the available evidence indicates that Goethe's own shortsightedness increased as he grew older.

In the poet's later dislike for specta-

cles, there may have been something of the professional pose of a man of art and letters at the court of Weimar. But there were more substantial, if not altogether worthy, reasons for his dislike. Himself shortsighted, yet proud of his personal appearance, he was at the same time unwilling to hide his features behind the heavy frame, and indisposed to concede to those who interviewed him the strategic combination of keener vision with diminished visibility.

In Wilhelm Meister's Wanderjahre, Goethe speaks of glasses as favoring darkness and inward falsity. "He who wears glasses regards himself as wiser than he is." "Whenever I look through glasses, I am another person and am displeasing to myself; I see more than I ought to see, the world which I thus see more sharply defined does not harmonize with my inward self, and I quickly lay the glasses aside as soon as my curiosity as to the nature of this or that distant object is satisfied."

In his diary for March 29, 1827, he writes: "Dr. Rose came to see me . . . . but I dismissed him shortly though courteously enough, on account of his accursed glasses."

Five years earlier he had written to a friend concerning a young man named Schubarth in whom he was interested: "In view of his other advantages, I had to excuse the fact that he wore spectacles for his weak eyesight, for I am a great enemy of these glass eyes behind which one has to search for the natural ones."

In 1820, at the age of eighty years, he read without glasses, according to Eckermann. In 1826 he remarked to the pianist Wolff during a visit from the latter: "Sit down over there at the piano, but take your glasses off, they disturb me."

His preference for the "naked eye" even found expression in a poem of three stanzas, entitled "Hostile glance" ("Feindseliger Blick"). In this he refers to the wearer of spectacles as putting on his mask, coming with spying glances, instead of speaking from eye to eye.

In this, as in some other details, Goethe was partly right, but mostly wrong. With a myopia probably as high as six diopters, his caprice sacrificed much for little. Yet the eye has always been the window of the soul. The gleam of the eye, its direction and movement, are more critically observed by lower animal and by man, in friend and foe, than any other feature. We are more greatly shocked by an anomaly or deformity in the external appearance of the organ of vision than by any other departure from the normal in those whom we have to meet or with whom we converse.

It was a consciousness of this supreme importance of the eye both to the observer and to the observed that gave rise to the many superstitions concerning the "evil eye"; for many of those who were supposed to have the evil eye were merely the unfortunate possessors of ocular disfigurements, particularly squint.

Among Europeans, and in some European nations more than others, prejudice against the wearing of spectacles is today greater than in the United States; and this objection is not confined to women. Some of the manifestations of esthetics are puzzling but intractable. In the most intellectual of mankind, intellect too often surrenders its prerogative to impulse.

W. H. Crisp.

BOOK NOTICES

Sclerosis of the retinal vessels. By N. Pines, London. Reprinted from the British Journal of Ophthalmology, 1929, March, April, and May. Octavo, paper covers, 98 pages, with numerous illustrations on plate paper. George Pulman and Sons, Ltd., London, 1929. (Price not given.)

The general character of this unusual thesis is indicated in the abstracts which have appeared on pages 540 and 611-612 of this volume of the American Journal of Ophthalmology. The author feels that the ophthalmoscope is seldom used in a proper way, even by those whose practice is limited to the eye;

and he emphasizes the desirability of the ophthalmic physician himself employing the sphygmomanometer in conjunction with the ophthalmoscope. He would have the same fullness of detail in description and explanation of an ophthalmoscopic examination as is usually allowed for a histological preparation. He is outspoken in his criticism as to ophthalmoscopic details which he believes have escaped earlier writers. He offers a number of original and independent explanations of various phenomena observed in the retinal circulation.

Greatly in love with his subject, it is even possible that the author has overestimated or even misinterpreted the significance of some of the details which he describes. But his thesis is extremely well written, interesting, and likely to stimulate useful thought and investigation in a vastly important field of ophthalmology and of general medicine.

W. H. Crisp.

L'éxtraction totale de la cataracte. (Complete extraction of cataract). Dr. de Saint-Martin, Toulouse, France. Octavo, paper covers, 56 pages, numerous illustrations. Published for the author by "Occitania," Paris and Toulouse, 1929. (Price not given.)

De Saint-Martin is a wholehearted propagandist of the method of Barraquer for intracapsular extraction. This monograph consists partly of addresses given before various French societies. It is very well illustrated by drawings of the capsulotomy operation, of Smith's operation, and of Barraquer's method, and also by some excellent photographs from a cinematograph film by Gaumont. The author insists that with the Barraquer method operative accidents are almost nonexistent, unfavorable results extremely rare, the duration of postoperative care decidedly shortened, and visual results equal to the best obtained by other methods, and in a larger proportion of the cases. The operation can also be resorted to at an earlier stage in the patient's disability. Certain precautions are necessary in the selection of suitable cases; and Barraquer himself is quoted as excluding the following types of cases: young patients, with an excessively resistant zonule (it is better not to do this operation before the age of sixty years); dislocated or complicated cataracts. It is to be remembered that hard, amber-colored cataracts have a large nucleus, that their extraction requires a larger corneal flap, and that they pass less easily through the pupillary sphincter. The surgeon should not attempt this new cataract operation until he has seen a number of such operations performed.

W. H. Crisp.

CORRESPONDENCE

Trachoma and its treatment

To the editor:

In concluding a most valuable article on the history of trachoma in this country, entitled "The Indian and the trachoma problem," in the June issue of this Journal, the author, Dr. L. Webster Fox, briefly speaks of the methods which he himself employs in the treatment of this malady. He says: "My preference is for the procedure known as grattage. In this the lid is everted, bringing into view the retrotarsal fold. . . . . The granulations are then scarified by a three-bladed knife, after which the area is vigorously scrubbed with a bichloride of mercury solution on a tooth brush, and an antiphlogistic lotion applied."

Concerning the measures thus advocated there is such a diversity of opinion that it may be worth while to mention a letter written by the late Professor Speciale Cirincione which appeared in the Annali di Ottalmologia under date of July, 1928.

"In Italy," he said, "there are 300,000 people who suffer from trachoma. They consume but they do not produce. There are many who, through enforced idleness, misdirect their energies and add to the population of the slums and

the prisons. To give health to the trachomatous is very easy. It is necessary only that they be persuaded that the most efficacious measures are those in which the conjunctiva is treated with mildness and extreme cleanliness, and that surgical intervention must be avoided as constituting the chief menace to the trachomatous cornea.

"I remember that when I was assistant in a clinic in the south, we saw cases of dense and extensive corneal pannus, such as I have never seen elsewhere, in individuals who had been subjected to scraping of the trachomatous conjunctiva; one patient reported having had twenty scrapings, never beneficial but always harmful. Scraping, which fortunately is disappearing from ocular therapy, produces an illusion in the patient, who, after removal of the papillae and nodules which make the conjunctiva irregular, feels an improvement at first, this being always favored by the bleeding and by the section of the nerve endings of the trigeminus; but when the scraped surface begins to cicatrize the illusion ceases, and the apparent improvement is followed by a prolonged period of pain because the cornea, traumatized by the roughness of the scars, becoming harder and harder, loses its epithelium, becomes vascularized, and renders the patient miserable for the rest of his life."

With opinions as widely diverse as those of Dr. Fox and of the ophthalmologists of Italy it seems thoroughly worth while that careful investigations should be made of the cases that have in early days been subjected to grattage and scarification, in order that their later condition may be determined.

It is interesting to know that Professor Maggiore of Sassari, coming from a section in which trachoma is endemic, will present a paper on this subject at the forthcoming ophthalmological congress at Amsterdam. Professor Maggiore recently declined promotion to the more important University of Bari in order that he might continue the work in which he is engaged for the control of trachoma in the island of Sardinia.

In the large cities of the eastern United States there is no trachoma except the occasional cases imported from elsewhere. It is difficult therefore to compare the results of different methods of treatment. It would be of great value if, five or even ten years after the treatment, an examination could be made as to the condition of those operated by grattage and scarification.

Park Lewis.

Buffalo, New York

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases, including parasites
18. Hygiene, sociology, education and history

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1. GENERAL METHODS OF DIAGNOSIS

Gaudissart, P. **Quantitative perimetry: perimetry with colors.** Ann. d'Ocul., 1929, v. 166, March, pp. 177-183.

Form and color fields can be intelligently compared only after equalization of the intensities of illumination.

Experiments of the author show that, in affections of the optic nerves from compression, tobacco-alcohol poisoning, and multiple sclerosis, the form and color fields are almost similar. *Lawrence Post.*

Lijo Pavia, J. **Stereoscopic vision in photography of the ocular fundus.** Arch. de Oft. Hisp.-Amer., 1928, v. 28, Sept., p. 489.

The author asserts that neither the professional artist nor the physician working with the camera lucida would be able to reproduce the ophthalmoscopic picture with the fidelity of the photograph. Besides, the former can never give the impression of relief, which is easily obtained with stereoscopy, for all details of the fundus of the eye. He states that the correct interpretation of the photographs requires a certain amount of training, but that this is easy to acquire. The sensation of relief can be obtained with an ordinary trial frame and two convex lenses of five diopters each, placing the picture at ten or fifteen centimeters distance from the eye.

The author reproduces a beautiful series of photographs, including myopia with chorioretinitis, retinal hemorrhages, macular changes in which the different planes of some of the lesions are apparent, and diseases of the optic nerve. *M. Uribe Troncoso.*

Lopez, L. J. **Biomicroscopy of the cornea with a lamp provided with two slits.** Arch. de Oft. Hisp.-Amer. 1928, v. 28, Nov., p. 617.

This paper is an abstract of the official report to the Spanish American Ophthalmological Society. First the problem of vital staining is reviewed in extenso. The author does not consider this method very useful, and employs instead several color filters. The sclerocorneal limbus is afterward described in detail, and the author's method of examination with two slits explained. Beautiful colored illustrations enrich the text.

M. Uribe Troncoso.

Spanuth, H. **Thirty years of reflexless ophthalmoscopy.** Zeit. f. Augenh., 1929, v. 67, March, p. 221.

In reflexless ophthalmoscopy the system of illumination and system of observation utilize separate zones of the pupil of the observed eye. There are four methods of arranging optical systems to bring this about. The author presents diagrams of each optical scheme and a table indicating which scheme is used in each of the ophthalmoscopes in common use. A new stereoscopic ophthalmoscope devised by Thorner and manufactured by Busch in Rathenau is described in detail. *F. H. Haessler.*

2. THERAPEUTICS AND OPERATIONS

Bartels, M. **Protective prothesis for radiation therapy.** Klin. M. f. Augenh., 1929, v. 82, May, p. 687.

Bartels emphasizes the fact that the paraffin filled protheses devised by him protect the eye only against radium, not against roentgen rays. For the latter the mercury prothesis of Rohrschneider gives much greater protection. *C. Zimmermann.*

Beigelman, M. N. **The untoward effects of protein therapy in ophthalmic practice.** California and Western Medicine, 1929, v. 30, June, p. 404.

(See editorial, page 686 of this issue of the American Journal of Ophthalmology.)

Den Hoed, D., Stoel, G., and De Vries, S. **Investigations on appropriate eye protection in radiation of the eyelids.** Klin. M. f. Augenh., 1929, v. 82, February, pp. 158-162. (1 ill. and 3 curves)

The authors found a layer of inorganic matter, e.g., paraffin, in the conjunctival sac to be the best protection for the eyeball. *C. Zimmermann.*

Lundsgaard, K. K. K. **Corneal section from the outside with a new knife.** Acta Ophth., 1929, v. 6, no. 4, pp. 311-316.

Lundsgaard emphasizes the difficulty of entering a very shallow anterior chamber with a knife or keratome. He has devised a new instrument to meet his needs. The instrument is briefly described as "a blunted knife of about one centimeter length mounted on an angular handle." The knife is applied from the outside of the cornea and enables the surgeon to make a broad aperture in the anterior chamber without the use of scissors to enlarge the opening. That the incision is linear and not convex is considered an advantage, as the iris almost always blocks the opening and allows escape of aqueous to be regulated. A double fixation forceps such as Axenfeld's is recommended. The method is useful for glaucoma, optical iridectomies, and foreign bodies in the anterior chamber.
E. M. Blake.

Pinticart Espinoza, E. **Ocular tuberculosis.** Arch. de Oft. Hisp.-Amer., 1928, v. 28, Sept., p. 501.

This author makes a plea for the use of the method of J. J. Viton, who recommends extremely small doses of tuberculin. The author asserts that in cases with intense positive Mantoux reaction the doses of tuberculin should be smaller than in the weakly positive cases. When the Mantoux test is negative, tuberculosis is probably very advanced, and very small doses should also be used. When there are no clinical signs of tuberculosis, higher doses should be employed. The author makes twenty dilutions of the old Koch tuberculin, which are changed every fifteen or twenty days, starting with 0.05 c.c. of the solution. She gives details as to the solutions to be chosen in relation to the various stages of tuberculosis. The Besredka test is said to have less value than the Mantoux.
M. Uribe-Troncoso.

Rohrschneider, Wilhelm. **A new prothesis for protecting the eye against roentgen and radium rays.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 169-171.

The new prothesis consists of a hollow shell of lead glass filled with mercury, whose absorbing power, dependent upon its atomic weight, is very

near that of lead. The cavity is 2.5 mm. deep, and the total thickness is from 3.5 to 4 mm. Radiograms show the superiority of this prothesis over the lead-glass prothesis of Müller.

C. Zimmermann.

3. PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Deutsch, A. **On the use of contact lenses in irregular astigmatism and high ametropia.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 295-309. (1 curve and 4 tables.)

Forty-nine patients (sixty-seven eyes) with an average vision of 6/60 were examined with contact lenses, arranged in tabular form. The best results were obtained in cases of very irregular astigmatism and not very opaque cornea, and in keratoconus without great changes of the conical apex. In twelve cases vision was not improved. Only three could wear the contact lenses the whole day, whereas in all others they were tolerated for only a few hours, but helped by improving the vision during work. The contact lenses of Zeiss fit very well, move with the eyeball and are usually not displaced by winking. If only one eye was corrected by a contact lens disturbing diplopia always occurred. *C. Zimmermann.*

Edmund, Carsten. **On the duration of luminous impressions.** Acta Ophth., 1929, v. 6, no. 4, pp. 414-424.

The work described by Edmund was done in association with Tscherning at the University of Copenhagen. If one places a light-absorbing glass in front of one eye it can be demonstrated that the clearer image is perceived before the less clear, the difference in time depending upon the velocity of movement and the difference in brightness of the two images. Since perception is not instantaneous, a moving object is not seen in its actual position and the time elapsing before the impression is realized is longer the fainter the light is.

The impression persisting some time after the stimulation has ceased to act is known as the "positive afterimage." The weaker the illumination for which the eye is adapted the longer does this impression persist and consequently the image is clearer. If there is a variation in the illumination in which an eye works there is a variation of the luminous impressions, and this variation depends upon the adaptation of the eye.

E. M. Blake.

Flaschenträger, H. **Iris diaphragm for amblyopes.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 358-360.

In amblyopic eyes with vision of 5/50 and 5/35, which can not be improved by glasses, vision can sometimes be increased to 5/20 by an iris diaphragm. The adjustable type whose diameter can be reduced to one or even to 0.5 millimeter, in a monocular lorgnette or in a spectacle frame, is the best. It is of advantage in the presence of corneal macula with irregular astigmatism or of moderate lens opacities. In albinos, in the color blind, with coloboma of the iris or aniridia, it serves as protection against light and for amelioration of sight. It is superior to the stenopeic hole in the immediate enlargement of the visual field obtained by opening the diaphragm.

C. Zimmermann.

Incze, Anton. **Myopia as a constitutional condition.** Zeit. f. Augenh., 1929, v. 67, Jan., p. 20.

The author has considered the myopia of 188 patients in relation to their body type and concludes that myopia is not an independent disease but rather one of the manifestations of asthenia universalis congenita Stilleri. The constitutional peculiarity of the sclera, weakness of an asthenic mesenchyme, makes possible the stretching of the sclera which results in the refractive error. What rôle is played by diurnal variations in intraocular pressure, paucity of adrenalin, secretion, or other general endocrine disturbance is still a matter of speculation. The heredity of myopia must

also be restudied to determine which factors are variable.

F. H. Haessler.

Marquez, M. **Some aspects of binocular and stereoscopic vision.** Arch. de Oft. Hisp.-Amer., 1928, v. 28, Aug., p. 430.

This very long article can not be properly abstracted. It is a review of the theories advanced to explain binocular and stereoscopic vision. The author believes that the former should properly be called "stereoscopic," and that that which now has this name should be called "pseudostereoscopic." The reason is that in binocular vision we see the real relief of the objects in space, while the latter gives only the illusion of relief. He studies first the projection of the visual images and the corresponding zones of both retinas, and then the semidecussation of the optic nerve in the chiasm in man and in some animals. Perception of relief in the case of a plane image has the same physiological basis as in binocular vision, the only difference being that in the latter the movement of convergence is made only once, while in the former there are numerous movements of convergence, from the base to the apex of the object, as in the perception of a solid body.

According to the author the illusion of relief in a double flat picture is obtained by provoking a diplopia in such a way that the two central images come in contact, while the two lateral images are excluded from fusion and lack relief. Stereoscopic vision can be obtained without any instrument either by looking at a picture in excessive convergence or by relative divergence.

M. Uribe Troncoso.

Ovio, Giuseppe. **Influence of black on vision.** Ann. di Ottal., 1929, v. 57, Jan., p. 1.

Knowing that a black substance is not an absolute black but a gray black the author seeks to determine to what degree this gray black is darker than white. By looking at a black material through a tube lined with black velvet in contrast with that in open daylight it will immediately be noted that the object seen through the tube will be the lighter of the two. Experiments were made to determine to what degree the difference exists between the black object and the dark chamber of absolute darkness. His conclusion is that absolute black is hardly more than 1/60 darker than India ink. This difference does not hold good for small objects such as printed letters. These reflect the light and if the illumination is diminished it affects equally the letters and the background, the contrast between the white and black remaining unchanged. If the white reflects ninety per cent of the light in good illumination and the black but three per cent, in poor light the white may be reduced to thirty per cent and the black to one per cent. In the first instance the difference is eighty-seven per cent, in the latter twenty-nine per cent.

Park Lewis.

Raubitschek, E. **Contribution to cylinder skiascopy.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 172-194. (10 ill.)

The author finds that a general appreciation of cylindrical skiascopy is hindered by the confusion in the terminology employed as between the two leading advocates of this method, Lindner and Krämer. He undertakes a series of definitions to eliminate this confusion. (The technique of this method was discussed along similar lines by Dr. Edwin R. Robertson at the meeting of the Kansas City Eye, Ear, Nose, and Throat Society on January 17, 1929. A report of that meeting appears on page 589 of the July issue of this Journal.)

C. Zimmermann.

Tron, E. J. **Variational statistical investigations of ocular refraction.** Russkii Opht. Jour., 1929, April, pp. 409-440.

By means of Tscherning's ophthalmophacometer and Javal's ophthalmometer the author determined in fifty-

five cases of various refractive errors the following optical elements: the curvature of the corneal and lenticular surfaces, the depth of the anterior chamber, the thickness of the lens, the refraction of the cornea and lens, and the axial length of the eye. By analyzing his own findings and those of Awerbach and Zeeman, he proves that refractive errors (with the exception of the higher degrees of myopia, beginning from 6.0 D.) do not depend on the axial length only, but also vary with the surface curvatures and refractive indices of the optical media.

M. Beigelman.

4. OCULAR MOVEMENTS

Parfonry, Jean. **Surgical treatment of paralytic strabismus.** Clin. Ophth., 1928, v. 17, Nov., p. 606.

Parfonry discusses fully the various surgical measures suggested for treatment of a paralytic squint and outlines the technique of the more important operations. He concludes (1) that only the paralyses incurable medically should be treated surgically, (2) that persistent diplopia can always be corrected, at least for the primary position, (3) that in paralysis of one of the recti muscles preference should be given to recession associated with advancement, (4) that in paralysis of one of the obliques advancement of the capsule should be utilized, and (5) that multiple paralyses are also susceptible to surgical treatment.

Phillips Thygeson.

Ribas, Valero, R. **Ocular dynamics.** Arch. de Oft. Hisp.-Amer., 1928, v. 28, Oct., p. 545.

This is a long monograph dealing with the action and nerve supply of the ocular muscles. The author studies the movements of each muscle and then the associated movements; and monocular and binocular vision, especially in regard to the nerve supply. A complete scheme is given of the relations of each ocular muscle with the nervous pathways and centers.

M. Uribe Troncoso.

Sattler, C. H. **The importance of the early treatment of squint.** Deutsche med. Woch., 1928, v. 54, May 11, p. 771.

Amblyopia must be prevented by early stereoscopic training. In the periodic stage of strabismus in seven children, diplopia with good vision of each eye was found. When the strabismus had become continuous one eye became amblyopic. The amblyopia can be cured almost without exception by complete and prolonged occlusion of the better eye. The ordinary eye patch fails to produce this result and a mastisol bandage (a German liquid adhesive) is found necessary. Correction of refraction combined with occlusion of the better eye as practiced by the author was successful in bringing about vision of 0.5 to 1.0 in eighty-nine children, occlusion having been found necessary for one to six weeks in those of one to two years, for one to three months in those of four years, and for one to three years in those of eight to twelve years, depending on the duration of the amblyopia. Cases with eccentric fixation are the most difficult, but in thirty-five out of fifty-two cases central fixation was secured, one case necessitating uninterrupted occlusion for one year. The better eye became amblyopic in three cases only but recovered under occlusion of the fellow eye. Once the amblyopia is cured early stereoscopic training will prevent a relapse. For convergent strabismus of less than twenty degrees the author employs prisms in combination with the spherical correction, and the best results are obtained with those showing correct localization of the double images and of the binocular after-images. Duction tests are helpful in checking up on the degree of binocular single vision present under the use of prisms. Out of ninety cases of convergent strabismus fifty-nine proved to possess binocular single vision under the use of prism corrections, and eighteen of them were slowly found to require weaker and weaker prisms, while some

dispensed with them permanently or temporarily. The stereoscopic pictures worked out by Sattler with the aid of an artist have the advantage of interesting and holding the attention of children of three to four years.

M. Davidson.

Weckert. **Treatment of strabismic amblyopia.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 240-241. (2 ill.)

The good eye is covered by a tin shield fastened to the spectacle frame for constant use, not for a few hours only. A considerable improvement of the sight of the amblyopic eye is observed within the first three days, and the children soon learn to move about and to read the large print of the primers. *C. Zimmermann.*

5. CONJUNCTIVA

Hanke, Viktor. **Trachoma.** Wiener klin. Woch., 1929, v. 42, Jan. 10, p. 45.

The author gives a very interesting review of the work that has been done in trachoma, and of the investigations as to its etiology. He reviews acute and chronic trachoma and advises that the diagnosis be made from its course rather than from the laboratory findings of the inclusion bodies at this time.

B. Cushman.

Löwenstein, Arnold. **A modification of Denig's conjunctivoplasty.** Zeit. f. Augenh., 1929, v. 67, Jan., p. 70.

In his modification of Denig's operation for tranchomatous pannus Löwenstein entirely avoids excision of conjunctival tissue. After novocain and adrenalin injection subconjunctivally he incises the upper two-thirds of the conjunctiva at the limbus with a fine scalpel and dissects it free from the sclera. The conjunctiva naturally retracts, because paucity of conjunctival tissue is characteristic of scarred trachoma in the stage in which the operation is indicated, and this retraction lays bare a crescent of sclera six to twelve millimeters wide. Into this area a piece of mucous membrane from the inner surface of the lower lid is implanted. The procedure probably produces retrogressive changes similar to those following peridectomy. *F. H. Haessler.*

Lundsgaard, K. K. K. **Can local administration of atropin cause amyloid of conjunctiva?** Acta Ophth., 1929, v. 6, no. 4, pp. 411-413.

Conjunctiva was excised by Lundsgaard from a sixty-two-year-old woman who had used atropin for four months and whose conjunctiva was thickened, dull gray in color, and suggested amyloid. Microscopic sections showed the epithelial layer to be thickened, with round cell infiltration present especially about the vessels, which had lost their usual structure and become thickened, with narrow lumina. The connective tissue formed bars and a network of fibers. Giant cells or calcareous deposits were not seen. The iodin-sulphuric-acid test gave the mahogany brown reaction of amyloid. The writer feels that atropin may cause amyloid degeneration in certain instances.

E. M. Blake.

Samkowski, J. C. **Chaulmoogra oil in the treatment of trachoma.** Zeit f. Augenh., 1929, v. 67, April, p. 330.

As this study was undertaken in order to establish the place of Chaulmoogra oil in the therapy of trachoma, the twenty-two cases in this series were treated without the aid of other measures. In each of fifteen of these cases one of the eyes was massaged with a bland oil as a control. It was found that chaulmoogra oil was not specific for trachoma, and was no more efficacious than other methods of treatment. Massage of the conjunctiva with vaseline or boric ointment gave as good results as treatment with chaulmoogra oil in trachoma and its complications, including pannus and corneal ulcers. The results of treatment depend on the intensity, frequence, and duration of the massage. *F. H. Haessler.*

Selenkowsky, J. W., and Malischeff, A. A. **Treatment of trachoma with radium emanation** (radon). Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 162-168.

The authors treated thirty-six cases (sixty-one eyes) of trachoma with radon, a radioactive gas which emits the same rays as radium. The favorable effect in trachoma seemed to be produced by the gamma rays, so that the alpha and beta rays were excluded by filtration. In the cells of the trachomatous conjunctiva accumulation of the cellular elements, alteration of the shape of the nuclei, and formation of granules and vacuoles in the protoplasm were the most conspicuous phenomena, suggesting that the therapeutic effect of radium and radon mainly consists in cytolysis of the elements of the trachoma follicle and of the trachomatous infiltration. From their observations the authors reached the following conclusions: Radium emanation therapy acts best in purely granular trachoma. In other stages it causes disappearance of the follicles and acts favorably on the diffuse infiltration of the mucous membrane. The majority of cases with pannus tenuis and corneal affections are benefited, but not those with pannus crassus. The time of treatment is shorter than that by the usual methods. In the applied doses radium emanation did not injure any other part of the eye, and particularly not the lens. *C. Zimmermann.*

Szily, A. **Clinic and pathological anatomy of ocular rosacea.** Klin. M. f. Augenh., 1929, v. 82, May, pp. 577-592. (10 ill., 3 colored, and 2 col. pl.)

Two clinical histories are reported in detail. Aside from the characteristic ectasia of the upper horizontal vascular net of the skin of the lids, and flat squamous papules at the lid borders, the conjunctiva, mostly in the palpebral fissure, presented ectatic blood vessels pointing toward opaque gray nodules around which they formed a radiating cluster. The corneas showed subepithelial and deeper infiltrations, with dotted opacities from which opaque streaks radiated into the still transparent tissue. In one case the numerous punctate scars and vascularized infiltrations were very dense, reducing vision to counting fingers at three meters.

Microscopic examination of excised pieces revealed accumulations of lymphocytes similar to follicles, with epithelioid cells in the center, at later stages granulation tissue, which was not characteristic, and giant cells of the foreign body type with softening of the center and superficial ulceration. The nodules contained abundant fibrin, which gave rise to peculiar formations resembling mycelium threads. The affection is almost always bilateral. Especial stress as to therapy is laid on treatment of the skin affection, in which roentgen radiation gave excellent results. Excision or cauterization of recent conjunctival foci had a beneficial effect. *C. Zimmermann.*

Vallery-Radot, P., Blamoutier, P., and Stéhelin, J. **Anaphylactic conjunctivitis and conjunctival crises in asthmatics.** Presse Méd., 1929, April 24, p. 529.

The ocular symptoms which accompany hay fever almost constantly can be explained as a sensitization of the conjunctiva to minute amounts of pollen. More rare is the anaphylactic conjunctivitis provoked by animal proteins to which the subject is sensitized. This type comes on suddenly and attains its maximum in a few minutes. The picture is then that of ordinary catarrhal conjunctivitis with edema of the lids, redness of the conjunctiva, burning of the eyes, lacrimation, etc. The conjunctivitis lasts at the most some hours and disappears without leaving traces. The skin reaction for the specific protein is usually strongly positive. Another type of conjunctivitis, similar clinically, can not be shown to have an anaphylactic origin but is caused by a sudden local vasomotor disturbance as in so-called vasomotor rhinitis. In certain of these cases the ocular symptoms are much more prominent than the nasal, and the condition may easily be

mistaken for the common infectious type of conjunctivitis.

Phillips Thygeson.

Weekers and Hubin. **Xanthelasma, generalized xanthoma, hemeralopia, and chronic icterus.** Bull. Soc. Belge d'Opht., 1928, Nov. 25, p. 15.

The exact nature of xanthelasma is debatable. The writers present a case which seems to demonstrate the hepatic origin of both xanthelasma and hemeralopia. Xanthelasma is connected with cholesteremia, in which condition deposits of cholesterin in the skin take place in a way analogous to the deposit of excess uric acid in the joints of gouty patients. Hemeralopia may be due to malnutrition, infections, autointoxications, etc. It may occur in liver disease with or without icterus. It may be a matter of qualitative change of the visual purple. In vitro cholate of soda is the best solvent of visual purple. Fundus changes are not usual. It has been demonstrated that in congenital hemeralopia there always exists latent or functional liver trouble.

J. B. Thomas.

6. CORNEA AND SCLERA

De Jaeger, M. A. **The surgical treatment of certain corneal affections.** Bull. Soc. Belge d'Opht., 1928, Nov. 25, p. 89.

In general, when an infected ulcer grows worse in spite of proper medical treatment it should be treated surgically. The same applies to hypopyon ulcers and corneal wounds with infection of the anterior segment, which should be treated thus from the first. The author reports three cases in detail, one of progressive catarrhal ulcer, one of hypopyon ulcer, and one of infected wound of the cornea. All cases responded promptly to curetting, early incision, and immediate covering of the wound with a conjunctival flap. This method is said to differ from that of Kuhnt, who advises the Saemisch incision in the late stage of serpignous ulcer and follows with conjunctival flap several days later. The incision is made on a plane with the ulcer and not at the limbus. The conjunctival flap completes the beneficent action: it will serve to fill up any loss of substance and in other cases serves as a protective and nourishing membrane.

J. B. Thomas.

Dekking, H. M. **Photography of the surface of the cornea.** Klin. M. f. Augenh., 1929, v. 82, May, pp. 640-647. (10 ill.)

As the methods of Gullstrand and Fischer are not adapted for general introduction into clinical practice, Dekking constructed a new apparatus on the principle of the disc of Placido, which gives simple and immediately understandable results, recording the whole corneal surface out to the limbus at one exposure. The apparatus is described in detail and illustrated, and on eight photographs the appearance of the normal cornea, of an astigmatic perforating wound, and of keratoconus is demonstrated. *C. Zimmermann.*

Hallenbach, George. **Capillary changes at the nail fold in parenchymatous keratitis.** Zeit. f. Augenh., 1929, v. 67, April, p. 306.

In recent studies of keratitis parenchymatosa the constitutional factors rather than the local changes have been stressed. The author has studied the morphologic and functional changes in the capillary system as an expression of a constitutional change in it. Because of the disturbance caused by inflammatory processes the capillary picture at the limbus can not be used in cases of keratitis. However, it is Enroth's opinion that the morphologic and functional mutations are the same in the capillaries about the finger nail as those in the limbus. The author observed and photographed the skin capillaries in over 100 patients, 23 of whom had unquestionable parenchymatous keratitis. It was possible to find a fairly uniform and characteristic picture from which the author concludes that parenchymatous keratitis must be considered not merely as a local reaction to invading spirochetes, but as such a reaction in

an organism which has been changed constitutionally by syphilis.

F. H. Haessler.

Junius. **Remarks on the article on rodent ulcer of the cornea by O. Triebenstein.** (Klin. M. f. Augenh., 1929, v. 82, p. 212). Klin. M. f. Augenh., 1929, v. 82, May, pp. 683-684.

Junius maintains that rodent ulcer is an independent clinical picture and differs entirely from rosacea keratitis.

C. Zimmermann.

Kleefeld, M. G. **Local insulin therapy in severe pneumococcic ulcers** (first communication). Bull. Soc. Belge d'Opht., 1928, Nov. 25, p. 38.

Experiment has proved in a general way that insulin applied locally has the remarkable property of changing an atonic ulcer with no tendency to formation of epithelium into an ordinary ulcer bordered by cells capable of growth and repair. It is at the price of vascularization that the cornea can defend itself against grave infection. In using insulin locally the author reports rapid cicatrization without vascularization. He gives the history of four cases treated successfully in this way. He treated with local insulin alone two eyes apparently destined to exenteration. The results were favorable and extraordinary. He believes that all grave cases of ulceration of the cornea justify local insulin therapy.

J. B. Thomas.

Korobova, V. **On the etiology of Krükenberg's spindle.** Russkii Opht. Jour., 1929, April, pp. 476-484.

An accumulation of pigment on the posterior surface of the cornea in the form of a vertical oval or "spindle" was first described by Krükenberg, in 1899, and for a long time it was considered as a congenital anomaly. The case reported by Korobova proves that Krükenberg's spindle may be an acquired pigmentation. In a patient fifty years of age the typical pigmentation of the cornea was noticed only in the right eye, while the cornea of the left eye was entirely free from pigment. However, in seven months a beginning pigmentation in the vertical meridian of the left cornea was also noticed. Because of severe pain in this eye which was blind on account of an advanced uveitis with a complicated cataract, an enucleation was done. Pathologic examination revealed changes identical with those in Hanssen's case, namely both proliferative and degenerative alterations in the pigment epithelium of the eye, liberation of pigment granules, and their migration into the corneal endothelium. The author assumes the following origin of Krükenberg's spindle. As the result of an inflammatory or degenerative process, pigment granules are set free from the intraocular epithelium. They are transferred by the general lymph current into the anterior chamber, and there, in analogy with the Ehrlich-Türk fluorescine phenomenon, they assume the form of a vertical line. Finally, through the phagocytic action of the corneal endothelium they are fixed as a vertical "spindle" on the posterior surface of the cornea.

M. Beigelman.

Potechina, E. **A case of scleral cyst following evisceration of the eye.** Russkii Opht. Jour., 1929, April, pp. 485-488.

A large scleral cyst developed after evisceration of the eyeball. The entire cyst and the remains of the globe were removed because of pressure symptoms. Microscopic examination showed the inner surface of the cyst to be lined with conjunctival epithelium which had obviously penetrated between layers of scleral fibers after evisceration of the eyeball. *M. Beigelman.*

Streiff, J. **Heroic treatment of pannus crassus and of certain cases of chronic purulent dacryocystitis.** Klin. M. f. Augenh., 1929, v. 82, May, pp. 673-679.

After a historical review of the heroic treatments of pannus, e.g. inoculation with blennorrhea, Streiff describes his own method of instillation of ninety-five per cent alcohol into the eye, leaving it for thirty seconds and subse-

quently irrigating with salt solution. After an hour the patient is discharged with a protective bandage. The alcohol produces a typical reaction with favorable results.

In two cases of extirpation of the tear sac renewed suppuration set in from a fistula. After testing the capacity of the cavity with injections of fluorescein, this was pressed out, replaced by ten per cent cocaine, and finally by a saturated solution of bichloride of mercury. After two applications the affection was cured.

C. Zimmermann.

Szily, A. **Clinic and pathological anatomy of ocular rosacea.** Klin. M. f. Augenh., 1929, v. 82, May, pp. 577-592. (See Section 5, Conjunctiva.)

Toro, Cayetano del. **Trachomatous pannus treated with milk injections.** Arch. de Oft. Hisp.-Amer., 1928, v. 28, Sept., p. 523.

The pannus covered the whole cornea, in an advanced case of trachoma. Several milk injections produced considerable improvement of the pannus, clearing the cornea and allowing ordinary treatments to be used.

M. Uribe Troncoso.

Van Duyse, M. **Trachoma in Belgium.** Bull. Soc. Belge d'Opht., 1928, Nov. 25, p. 131.

The author maintains that trachoma is on the wane in Belgium and advances the following reasons: The progress of hygiene in the last fifty years. More people accept hospitalization since they are indemnified for loss of time and wages. Trachoma is above all a malady of the poor. It survives mostly among those debilitated by undernourishment and excessively hard labor. In recent years workers have had better pay, better nourishment, better homes, shorter hours of work. These are the most important causes of regression of the malady. In discussion Coppez agreed that trachoma was on the wane in Belgium and protested against certain statistics that claimed the opposite.

J. B. Thomas.

Vogt, Alfred. **Investigations on the pigment ring of Descemet's membrane in pseudosclerosis.** Klin. M. f. Augenh., 1929, v. 82, April, pp. 433-449, and May, p. 672. (17 ill. 15 col. pl.)

The pigment ring in pseudosclerosis shows with the biomicroscope peculiar color phenomena extending from brown and yellow to green and ultramarine blue, which are identical with those elicited by colloid silver albuminate solutions "healed into" ("eingeheilt") the cornea. These colors have a tendency to spread into Descemet's membrane. Not only clinically, but also chemically, the pigment of Descemet's membrane is recognized as silver. The author's postscript (1929, May, p. 672) remarks that the identity of the colors found by G. Laski (Ann. der Physik, v. 53, 1917), in physical experiments with those observed by Vogt in the eye supplements and confirms his proof that the basis of the corneal pigment ring in pseudosclerosis is silver.

C. Zimmermann.

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Finlay, C. E. **Etiological investigation of diseases of the uveal tract.** Rev. Cubana de Oft. y Oto-Rino-Larin., 1929, v. 1, Jan., p. 17.

The search for focal infection must be most thorough, including the following routine: (1) syphilis, (2) tuberculosis, (3) examination of tonsils, (4) paranasal sinuses, (5) dental pyorrhea and abscesses, (6) gall bladder, (7) genitourinary system, (8) intestinal stasis, (9) other focal infections, (10) cytologic examination of the blood.

A. G. Wilde.

Hambresin, M. L. **Sympathetic ophthalmia following cataract operation.** Bull. Soc. Belge d'Opht., 1928, Nov. 28, p. 107. (See Section 9, Crystalline lens).

8. GLAUCOMA AND OCULAR TENSION

Abadie, C. **Glaucoma and its medical treatment.** Presse Méd. 1929, Feb. 16, p. 220.

Abadie reviews the subject of glaucoma and its treatment, stressing his own theories as to the origin and therapy of the disease. For the past thirty-one years he has held the belief that glaucoma is a disease not of the eye itself but of the sympathetic nervous system, resulting in stimulation of the vasodilators of the ocular vessels and consequent hypersecretion of intraocular fluid. On this basis he employs vasoconstrictors such as adrenalin and ergotin, and also calcium salts internally, with pilocarpin locally. He claims results superior to surgery in a large number of cases.

Phillips Thygeson.

Kronfeld, P. C. **The intraocular tension following puncture of the anterior chamber.** Arch. of Ophth., 1929, v. 1, April, pp. 450-458.

The author investigated the tension in four eyes following drainage of the anterior chamber. He found tension of five mm. twenty to thirty minutes after tapping. The original tension recurred in from sixty-five to seventy-five minutes, and a maximum was reached in about ninety minutes after the puncture, the peak being from six to eight mm. above the original tension. Transient cardiovascular disturbances increased the rapidity of this reduction. Pilocarpin, on the other hand, reduced it. The author believes that the intraocular tension is the result of the production of intraocular fluid and that this depends upon the vascular apparatus. He feels that the inflow depends upon the condition of the capillary walls and the permeability of their lining membrane. He found that in twenty minutes from fifty to sixty per cent of the total volume of the aqueous was reproduced. This about corresponds with the tension of five mm. which he found to be usual after this same interval of time. He agrees with Wessely that there are only quantitative differences between the regeneration of the aqueous in the eyes of human beings and of animals, and that the second aqueous is derived from the blood. During regeneration of the aqueous there are marked vasomotor changes in the eyes of animals, less so in human beings, probably because of greater stability of the vasomotor mechanism in the latter.

M. H. Post.

Mauksch, H. **A new glaucoma operation.** Zeit. f. Augenh., 1929, v. 67, April, p. 313. (See American Journal of Ophthalmology, 1928, v. 11, Dec., p. 1020.)

Samojloff, A. J. **The action of pilocarpin on intraocular pressure.** Klin. M. f. Augenh., 1929, v. 82, April, p. 486-499. (16 curves.)

Samojloff reports his experiments on rabbits for comparative measurements of ocular tension, general blood-pressure, and blood-pressure in the ocular vessels after subconjunctival injections of pilocarpin. The curves show that neither the blood-pressure in the ocular vessels nor the general blood-pressure can be regarded as the chief factor in the beneficial effect of pilocarpin on ocular hypertension in glaucoma. Not until some way is found to ascertain the activity of the specific regulating apparatus of the eye, independent of blood-pressure, will the complicated question of the mechanism of pilocarpin action on ocular tension be completely explained.

C. Zimmermann.

Szafnicki. **A new procedure for executing the Lagrange operation.** Arch. d'Opht., 1929, v. 46, April, p. 228.

The instrument described, for simplifying sclerectomy in the Lagrange operation, consists of a keratome fitted with a shoulder-stop as in a paracentesis needle, and a second, semilunar blade which slides down the back of the keratome to bite out a semilunar crescent of sclera four mm. long and one mm. wide. Thus the sclerectomy and incision are done in one step.

M. F. Weymann.

Yudkin, Arthur M. **The formation of the aqueous humor: its relation to intraocular and vascular pressures.**

Arch. of Ophth., 1929, v. 1, April, pp. 435-446.

The constitution of the aqueous is discussed in detail. The arguments supporting the secretion theory are then discussed and refuted in the light of recent findings. After that the filtration theory is studied, and in the author's opinion it does not satisfactorily account for the known constitution of the aqueous. He sums up with the conclusion that the intraocular fluid is derived from the blood stream by the same forces that are responsible for other fluids in the tissues, and he states that "the factors involved in the formation of the fluid are the hydrostatic pressure of the two systems, the permeability of the intraocular vascular capillaries and the osmotic pressure of the blood plasma against the intraocular fluids." He feels that the intraocular fluid is a dialysate of the blood plasma, in that the capillary wall and the tissue covering it have a functional adaptation for keeping the media of the eye transparent and for helping to regulate the slow, continuous process of exchange; and that the balance between the hydrostatic and osmotic pressures of the arterial and venous plasmas within the eye results in determining the intraocular pressure, the circulation of the intraocular fluid depending on the metabolic change and the related vascular reaction.

M. H. Post.

9. CRYSTALLINE LENS

Fischer, Franz. **Cavity formation in the lenses of human embryos.** Zeit f. Augenh., 1929, v. 67, April, p. 295.

In the embryological collection of the Vienna university is a human embryo 16.5 mm. long, in each lens of which there is a cavity beneath the anterior lenticular epithelium. This cavity, which is empty, has the form of a large flattened ellipsoid. Its posterior wall, which consists of the lens fiber mass, is vacuolated and irregular in the upper half, and smooth in the lower. The anterior wall is the lens epithelium. In every other respect the embryo is normal. Comparison with twenty-nine other embryos, similarly treated technically, convinces the author that the cavity is not an artefact, nor the remains of the normal lens cavity which has usually become closed in embryos fifteen to sixteen mm. long, but an independent pathological manifestation of unknown etiology.

F. H. Haessler.

Hambresin, M. L. **Sympathetic ophthalmia following cataract operation.** Bull. Soc. Belge d'Opht., 1928, Nov. 25, p. 107.

The author reports a case of sympathetic ophthalmia following a cataract operation three months previously. After vigorous local and general treatment the operated eye improved considerably. The nonoperated eye, which was also cataractous, grew worse. This condition persisted for about eighteen months, when the nonoperated eye was finally removed. The remaining eye was needled and useful vision secured. The author has collected eleven cases in all. Of these seven had inclusion of the iris and three escape of the vitreous. In three cases in which neither eye was removed there remained some vision in the operated eye but complete blindness in the other. Removal of the operated eye in five cases gave a good result in only one case. The point is emphasized that sympathetic ophthalmia following a cataract operation is particularly virulent; also that several authors have had the good fortune to conserve the operated eye. In the discussion of the paper Coppez voiced a vigorous warning against interference with a prolapsed iris either with scissors, galvanocautery or spatula if three days have passed since the trauma, on account of the risk of inducing sympathetic opthalmia.

J. B. Thomas.

Kubik, J. **Intracapsular cataract extraction according to Stanculeanu-Török.** Klin. M. f. Augenh., 1929, v. 82, May, pp. 592-619. (2 ill.)

Kubik reports his experience with the intracapsular cataract extraction according to Stanculeanu-Török, at the

clinic of Elschnig at Prague; giving a picture of the advantages and disadvantages of this operation by stating the results. The method as practiced at the clinic is described in detail. According to Kubik the chief advantages of this method of intracapsular extraction are lack of necessity for a secondary operation, shorter healing period, quicker attainment of useful vision, and striking absence of irritation during after-treatment, because of absence of lenticular remains. For an experienced operator the risk is not greater than with the usual extracapsular extraction. A disadvantage is sometimes displacement of the pupil upwards. This would demand iridectomy in an imperfectly normal condition in the iris of older people. The main fields for intracapsular extraction are (1) incipient and immature cataract if the capsule is not too tense, and (2) of mature and hypermature cataracts only those cases in which the intumescence has receded so that the tension of the capsule is diminished. It is specially valuable in diabetics, in whom remnants of cortical matter are known to entail long and severe irritation. It is also good in highly myopic eyes and for cyclitic cataracts.

C. Zimmermann.

O'Brien, C. S. **Akinesis during cataract extraction.** Arch. of Ophth., 1929, v. 1, April, pp. 447-449.

The author reports two hundred cases in almost all of which akinesis of the muscles controlling closure of the lids has been complete by his method. The nerve trunk of the temporal branch, malar branch and infraorbital branch of the seventh nerve may be found by following the side of the zygoma to a point just in front of and slightly below the external auditory meatus. Placing the finger at this point, the patient is asked to open the mouth and the condyle of the mandible is felt to slide forward. The jaw being closed again, the needle is inserted at this point and passed directly down until the condyle is felt and one centimeter of two per cent procaine solution is injected. The needle is then slowly withdrawn and a second centimeter is passed just superficial to the former. Akinesis begins in from one to two minutes and the full effect is felt after about five minutes. In no case has there been prolonged paralysis. *M. H. Post.*

Terrien, F. **Hereditary familial cataract and myopathy.** Arch. d'Opht., 1929, v. 46, April, p. 193.

A very detailed description of the case of a patient thirty-seven years old, presenting muscular atrophy, more marked in the lower extremities, is given. The condition was progressive and began at the age of twenty years. There was no family history of myopathy but the paternal grandmother, the father, and an aunt had cataracts at sixty years of age. The patient's right eye had been convergent in childhood and was amblyopic. The vision in both eyes was counting fingers. The slit-lamp showed a peculiar type of lens opacity in that the superficial layers of the anterior cortex contained punctiform white opacities and the posterior cortex contained radial opacities, while the nucleus was clear. No red or green reflecting particles were found as described by Vogt. It is pointed out that, while this type of cataract is found associated with myotonic dystrophy, it is not pathognomonic. The underlying pathology of this condition is still not clear, but it may have some relation to the endocrine system. In this case the Wassermann reaction was negative.

M. F. Weymann.

10. RETINA AND VITREOUS

Beigelman, M. N. **Acute hypotony in retinal detachment.** Arch. of Ophth., 1929, v. 1, April, pp. 463-467.

The author reports two cases of acute hypotony in retinal detachment. They are characterized by a great decrease of ocular tension, sudden deepening of the anterior chamber, and a mild form of uveitis. The retina is always detached. The prognosis is favorable and the treatment should be conservative. It is

probably the result of sudden absorption of fluid in a liquefied vitreous. In the author's opinion it is a definite clinical entity. *M. H. Post.*

Rønne, Henning. **Septic periphlebitis of the central retinal vein.** Klin. M. f. Augenh., 1929, v. 82, April, pp. 476-479. (1 ill.)

A woman aged twenty-four years who had been in the hospital five months on account of sepsis, pneumonia, pericarditis and arthritis, showed numerous hemorrhages, white patches, and white sheaths surrounding the retinal veins. As the chief affection was a protracted sepsis which was unexpectedly cured, the author interpreted these bands as infectious infiltrations of the perivascular spaces. Similar affections undoubtedly occurred also in the choroidal veins, terminating in choroidal atrophy, and, by transference through the vortical veins, causing tenonitis, which again explains the exophthalmus and chemosis, and the opacities of the vitreous. Repeated cultures from the blood were sterile, so that recovery from the main disease and from the retinal complication was due to a benign bacterial infection. Right vision was restored to 6/60, left 6/6.

C. Zimmermann.

Rutberg, N. M. **A case of retinitis circinata.** Zeit. f. Augenh. 1929, v. 67, April, p. 323.

The author describes his findings and discusses the differential diagnosis in one case of unilateral retinitis circinata. The condition was completely described by Fuchs in 1891 and the compilation by Leber in the Graefe-Saemisch Handbuch twenty-five years later is said to have added nothing essential to the understanding of this disease.

F. H. Haessler.

Salus, R. **Changes of the retinal veins in general hypertension.** Klin. M. f. Augenh., 1929, v. 82, April, pp. 471-475. (8 ill.)

Salus found, as a sign of general hypertension, changes of the retinal veins at the intersections with the arteries. The pressure of the overlying artery, stretched and thickened, impedes the circulation in the vein. Then the blood current tries to overcome this, causing the vein to deviate backward into the retina until a sufficient layer of tissue is interpolated between the artery and vein, and the direct pressure of the crossing artery ceases. Thus the indentation of the vein in an advanced stage is converted into an arc (Kreuzungsbogen), which appears thinner than both sections of the vein or entirely disappears under the overlying tissue. In every case which followed this crossing arc, as the author observed on almost two hundred cases, increased blood pressure existed. These crossings occur most frequently along the superior temporal retinal vein, but also along the superior nasal, less often downward from the disc.

C. Zimmermann.

Vogt, Alfred. **Treatment of detachment of the retina by ignipuncture of retinal tear.** Klin. M. f. Augenh, 1929, v. 82, May, pp. 619-632. (See American Journal of Ophthalmology, 1929, v. 12, June, p. 541.

Wegner, Wilhelm. **Observations on the clinical value of operative treatment of opacities of the vitreous.** Klin. M. f. Augenh., 1929, v. 82, April, pp. 453-470.

Aspiration of the vitreous and the technically easier posterior sclerotomy aim at stimulation of metabolism of the vitreous, and at better nutrition of the retina through hyperemia of the intraocular vessels and conveyance of bactericidal substances into the vitreous. After a review of the literature eighteen clinical histories of cases of intraocular hemorrhage, spontaneous or after injury, and of opacities with uveitis, are reported in detail. In these aspiration was performed thirteen times, posterior sclerotomy twenty-two times. Three cases were made worse. Both procedures are serious and their indiscriminate employment must be urgently warned against. Often they are successful, but

they are uncontrollable in their consequences. They are to be confined to eyes in which nonoperative absorbing measures have proved unsuccessful and in which vision is so greatly impaired that something may be gained and nothing is likely to be lost from the operation. Then posterior sclerotomy is preferable. *C. Zimmermann.*

12. VISUAL TRACTS AND CENTERS

Coppez, M. H. **Traumatic bitemporal hemianopsia: evaluation of permanent disability.** Bull. Soc. Belge d'Opht., 1928, Nov. 25, p. 122.

The author reports a case of basal fracture of the skull followed by bitemporal hemianopsia due to rupture of the crossed fibers of the chiasm. He notes the slight degree of visual disturbance due to alteration of the field, as the nasal field of the opposite eye makes up partially for absence of the temporal field. The binocular field is but little restricted. It is noted that an official bulletin which treats of the permanent disability following war injuries fixes such disability at forty per cent in bitemporal hemianopsia and at twenty-five per cent in homonymous hemianopsia. Coppez agrees with others that the former percentage should be reduced from forty to twenty.

J. B. Thomas.

13. EYEBALL AND ORBIT

Esteban, Mario. **Bilateral pulsating exophthalmus.** Arch. de Oft. Hisp.-Amer., 1928, v. 28, July, p. 369.

The difficulties of topographic diagnosis were considerable, it being doubtful at first on which side surgical treatment should be undertaken. The patient was an aviator who in 1928 fell in an airplane from a considerable height. He sustained a fracture of the base of the skull, and was twenty days unconscious. He then had incoordination of the movements of both legs, and loss of memory. From the first days after the injury a great proptosis appeared in both eyes. After three weeks, when the patient recovered consciousness, he began to notice a loud intracranial noise, which increased when the body was bent forward. This noise was so intense that he could not sleep. Vision, however, was fully preserved. Two years afterward the left eye began to turn inward and diplopia appeared. The right eye then began to lose sight, and in the last months he suffered intense pains in this eye, which became blind.

On examination the author found bilateral proptosis, so advanced that the eyeballs were almost outside of the orbits. There was paralysis of both internal recti. Pressure on both eyes reduced the exophthalmus, especially if at the same time the left carotid was also pressed upon.

Pulsation was not very marked, but with the stethoscope blurring murmurs and a continuous whirring were heard. The murmur could also be heard up over the temporal region, the cheek, and the nose. Pressure on the right carotid had no influence upon the murmur, but when made upon the left the murmur disappeared on both sides. The right eye had a considerable hypertension, the vitreous was cloudy, and vision lost. Of the left eye the tension was normal, the media clear, the disc normal, and the veins very large and tortuous.

X-ray examination did not show even traces of the old fracture. The author used an original method of recording the pulsations in the eye. A sphygmomanometer was placed upon the eyeball, and with this were obtained graphs of the pulsations in each eye, and also of the changes produced by pressure on the carotid on each side.

The author thinks that rupture of the left internal carotid in the cavernous sinus gave rise to stasis, and then, when the sinus became insufficient, arterial blood invaded the transverse sinus and the coronary and extended to the right side. The glaucoma in the right eye was probably due to venous congestion, being analogous to that produced experimentally by ligation of the vortical veins.

The patient learned to compress the common carotid himself, but without marked permanent results. Under local anesthesia the left common carotid

was ligated. Success was complete, pulsations and intracranial noises vanished, and the proptosis almost disappeared. The glaucomatous eye improved a great deal. *M. Uribe Troncoso.*

Ferrer, Horacio. **Voluntary propulsion of both eyes.** Arch. de Oft. Hisp.-Amer., 1928, v. 28, Nov., p. 637. (See American Journal of Ophthalmology, 1928, v. 12, Nov., p. 883.)

Kleefeld, M. G. **Treatment of orbital phlegmon by osmotic drainage.** Bull. Soc. Belge d'Opht., 1928, Nov. 25, p. 31.

Deep incisions often fail to drain the edematous tissues. There is danger of optic nerve infection and corneal destruction of trophic origin. To induce the flow of fluids from the orbit and thus relieve pressure the writer uses the principle of osmosis. A strongly hypertonic solution of sugar has a complex action on the infective process in cellular tissue. The author uses a sugar syrup containing sixty-five per cent saccharose per kilo. This he boils and drops into fenestrated drainage tubes within the wound. The entrance of the drain is covered with compresses dripping with syrup. In some cases he uses moist wicks instead of rubber drains. The appearance of pus is hastened by this process, the edematous fluid is "pumped out," and the exophthalmos lessens rapidly. *J. B. Thomas.*

Streiff, J. **Pulsatory movements of the anterior ciliary arteries and topographic relations between the anterior ciliary arteries and the summits of the loops of the ciliary nerves of Axenfeld in the clinical picture.** Klin. M. f. Augenh., 1929, v. 82, May, pp. 633-640. (5 ill.)

In twenty-six out of two hundred pupils (thirteen per cent) of a school at Genoa Streiff saw pulsatory fluctuations of the initial part of the anterior ciliary arteries, sometimes due solely to the emotional effect of examination with the binocular loupe. He shows that even in the living eye the loops of the anterior ciliary nerves of Axenfeld are not infrequently noticeable during regular inspection of the anterior scleral segment, their summits projecting from the sclera. The not infrequent relation of a loop of a ciliary nerve to the course of an anterior ciliary artery gives the impression that by preference the loops use arterial emissaries as conductors, since embryologically the vessels precede the growth of the ciliary nerves. Wherever this relation is lacking the loop must have forged its way independently. The ciliary nerve loops, in consequence of their rather frequent occurrence, seem to be regarded not as an abnormal variation or malformation, but as a practical solution of the complicated task of the nerve supplying the ciliary body and the sclera.

C. Zimmermann.

14. EYELIDS AND LACRIMAL APPARATUS

Beauvieux. **Concerning extirpation of the lacrimal sac.** Arch. d'Opht., 1929, v. 46, April, p. 205.

The necessity for avoidance of hemorrhage during removal of the sac is emphasized. It can be avoided if one places the incision properly and does not use sharp dissection after making the skin incision. For the entire operation the writer uses a slightly curved small bone chisel made by Luer. The skin incision is made three mm. internal to the canthus and extends from four mm. above to ten mm. below it. When the canthal ligament is exposed, it is cut next to the bone with the chisel directed outward. With the chisel the sac is easily freed first on the internal wall, then above, and then on the external wall. It is then cut in the canal and the canal is curetted. The sutures are placed without drainage.

M. F. Weymann.

Parazols. **Stricturotomy and large sounds in the treatment of affections of the lacrimal canal.** Arch. d'Opht., 1929, v. 46, April, p. 217.

The method of stricturotomy and

passage of large probes, described by Poulard, was found more satisfactory for treatment of lacrimation and chronic dacryocystitis than any other method. Of eight cases of simple epiphora, five were cured. Of five cases of mucocele, three were cured and two improved. Of twenty-two cases of dacryocystitis, 77 per cent were cured, 13 per cent improved, and 9 per cent unimproved. The observations are given in some detail.

M. F. Weymann.

Rasquin, M. E. **Alcohol injections in the treatment of pain following zona ophthalmica.** Bull. Soc. Belge d'Opht., 1928, Nov. 25, p. 124.

In the stubborn pain of zona, which also originates in a branch of the fifth nerve, Rasquin has taken up the method of nerve injection with alcohol as applied in trigeminal neuralgia. Zona is not always limited to the territory served by the ophthalmic branch, but the report of the author is based upon cases in which this branch was treated. A description of the anatomy of this nerve with its branches is given, and of the technique of the injections. Five cases were treated, one with complete relief, one with partial relief, two with relief of the skin pain, and one with partial relief of the skin pain, with pain in the globe persisting.

J. B. Thomas.

Streiff, J. **Heroic treatment of pannus crassus and of certain cases of chronic purulent dacryocystitis.** Klin. M. f. Augenh., 1929, v. 82, May, pp. 673-679. (See Section 6, Cornea and sclera.)

15. TUMORS

Hilden, Bertel. **Malignant papilloma of the tear sac, also a case of cell metaplasia in the lacrimal passages.** Klin. M. f. Augenh., 1929, v. 82, May, pp. 661-665. (3 ill.)

A man aged eighteen years, who had complained of epiphora for several months, had a little tumor projecting from the right lower tear point. It was removed, but recurred as a light red lobulated formation of the size of a hemp seed. The canaliculus was dilated and the lacrimal duct was found permeable on irrigation. The canaliculus and the tear sac, the latter of which was completely filled by the tumor, were extirpated. The growth proved to be a malignant papilloma. The patient returned after a month perfectly cured.

The original cylindrical epithelium of the portion of the tumor projecting from the tear point was replaced by pavement epithelium, from mechanical irritation (movements of the lids).

C. Zimmermann.

Morosoff, N. **Rare congenital tumors of the eye.** (Teratoma.) Russkii Opht. Jour., 1929, April, pp. 467-475.

In a boy six years old the right orbit was filled with a solid, greatly protruding tumor without any visible remains of the eyeball. The parents stated that a white round spot near the corneal limbus had been noticed at birth, but that there was no increase in its size up to the age of eighteen months. Exenteration of the orbit was performed, and on pathological examination a teratoma was found. It consisted of various types of connective tissue, of nondifferentiated epithelium, of cartilage, and of nervous ganglions and glial tissue. The rapid growth of this tumor, the destruction of the eyeball, and the presence of nervous cells which are characteristic of intervertebrates are stressed as the rare peculiarities of this case.

M. Beigelman.

16. INJURIES

Lederer, Rudolf. **Premature presbyopia in laborers exposed to the open furnace.** Klin. M. f. Augenh., 1929, v. 82, May, pp. 656-661.

In examining workers in glass factories Lederer found that those working before open fires needed presbyopic glasses earlier, and stronger ones than corresponded to their ages. He ascribes this to the nature of their work, not to premature age of the population of this district, as the comparison with laborers at other occupations in the same region

proved. There were no visible changes in the lens, and the limitation of accommodation is ascribed to the damaging influence of radiating energy upon ciliary body and ciliary muscle.

C. Zimmermann.

17. SYSTEMIC DISEASES, INCLUDING PARASITES

Anargyros, Elie. **Some cases of ocular complication during an epidemic of dengue fever.** Arch. d'Opht., 1929, v. 46, April, p. 214.

One case of dacryoadenitis of the left side occurring during dengue fever and lasting fifteen to twenty days is described. A case of simple iritis in the left eye is mentioned. In a woman fifty-five years old, an attack of retinal hemorrhages was noted. The urine was normal. Glaucoma occurred in a woman of forty-eight years. On the fourth day of the fever she was operated on, and later she had to have the second eye operated on for a similar attack. In another patient of fifty-four years, who had a quiet absolute glaucoma in the right eye, this eye became painful during convalescence from the fever and had to be enucleated. Hemorrhages were found in the vitreous. It was thought that the toxemia associated with the fever might have been the immediate cause of these complications.

M. F. Weymann.

Charamis, Spilios. **The ocular complications of dengue fever during the last epidemic in Greece.** Arch. d'Opht., 1929, v. 46, April, p. 210.

During the epidemic of dengue fever at Athens numerous ocular complications were observed. Orbital pain localized behind the eye, with photophobia, was seen in two cases. There were two cases of classical optic neuritis. Many patients showed ulcerative keratitis, beginning with peripheral ulcers and going on to perforation. There were many conjunctivitides. An increase in the progress of cataract was noted. In scrofulous individuals one observed pustular ophthalmia. Most of the affections described might have occurred because of lowered resistance during the fever.

M. F. Weymann.

NEWS ITEMS

News items in this issue were received from Drs. H. Alexander Brown, San Francisco; E. V. L. Brown, Chicago; H. N. Blum, New Orleans; C. A. Clapp, Baltimore; Gaylord C. Hall, Louisville; G. I. Hogue, Milwaukee; M. Paul Motto, Cleveland; and G. Oram Ring, Philadelphia. News items should reach **Dr. Melville Black,** Metropolitan building, Denver, by the twelfth of the month.

Deaths

Dr. William W. Goldnamer of Oakland, California, died May thirteenth at the age of fifty-seven years.

Dr. T. Liggett Bailey, Madisonville, Kentucky, aged forty-one years, died of pneumonia after a short illness.

Miscellaneous

Adolph Lewisohn of New York has given $30,000 to endow a fellowship at the Wilmer Ophthalmological Institute at Johns Hopkins hospital, Baltimore.

The fund of $125,000 from the Wilmer Foundation of New York City has been given to the Wilmer Ophthalmic Institute, allowing completion of the building. The official opening will take place on the fifteenth and sixteenth of October. The total funds contributed by the General Educational Board and individual givers amount to $3,700,000.

The National Society for the Prevention of Blindness expresses gratitude at the cooperation it is receiving from the public schools, the League of Red Cross Societies, and the American Federation of Labor. It has always received the hearty cooperation of the ophthalmologists. The Society estimates that in this country there is need for nearly five thousand sight-saving classes. There are now only three hundred and eighteen, but the supply of these classes is growing rapidly all over the country.

The Medical Society of the District of Columbia, through its Section of Otolaryngology and Ophthalmology, has made recommendations to the American Automobile Association relative to the visual and hearing tests of drivers of motor vehicles. The Society recommends that applicants for li-

censes be examined by a physician when vision is less than 20/40; that there be no double vision; that the temporal fields be normal; that the spoken voice at two feet be audible in at least one ear; and that drivers who have serious accidents shall be examined before their licenses are removed. The American Automobile Association replied in part that "until those who wilfully disregarded the common courtesies and laws of driving are removed from the streets and highways, we will oppose subjecting the great majority of motorists who have been operating without serious accident to mandatory physical examination".

From July 22 to 27, in Paris, under the presidency of Professor D'Arsonval, was held the "International week of therapeutic light". The official languages were French, Italian, German, and English. Various special problems of phototherapy were discussed.

May tenth was the centenary of the death of Thomas Young, M.D., F.R.S., whose contributions to ophthalmology, to the theory of light, to the existence of astigmatism in the human eye, and to the principles of color vision, as well as his labors in connection with the nautical almanac and his researches into the hieroglyphics of ancient Egypt, gave him very high rank in the world of science.

The Middlemore prize of the British Medical Association (1928) has been awarded to Mr. W. S. Duke-Elder for an essay on "the clinical study of the vitreous body, its swellings, contractions, opacities, and reactions to toxic invasions; with special reference to glaucoma and detached retina".

The next examination conducted by the American Board for Ophthalmic Examinations will be held on October twenty-first in Philadelphia, just before the meeting of the American Academy of Ophthalmology and Otolaryngology at Atlantic City.

The seventh annual summer graduate course in opthalmology and otolaryngology under the auspices of the Colorado Ophthalmological Society and Colorado Otolaryngological Society was given June seventeeth to twenty-ninth, one month earlier than usual, on account of the meetings occurring during July at Salt Lake City, San Francisco, and Portland. In spite of the change of date, about fifty visiting physicians were registered for the course. Lectures in ophthalmology were given by Drs. E. C. Ellett, Memphis; Clifford Walker, Los Angeles; Arthur J. Bedell, Albany; Henry P. Wagener, Rochester, Minnesota; Edward Jackson, William C. Finnoff, and Melville Black, Denver. The demonstrations in ophthalmology were given by the following Denver men: Drs. Wm. M. Bane, Wm. H. Crisp, J. A. McCaw, Donald H. O'Rourke and J. M. Shields. The two final days of the meeting were devoted to the summer Congress of Ophthalmology and Otolaryngology. The program was participated in by Drs. Arthur J. Bedell, Albany; Wm. C. Finnoff, Denver; Clifford Walker, Los Angeles; Donald H. O'Rourke, Denver; Charles M. Swab, Omaha; and Edward Jackson, Denver. Following the meeting a good many men went to Salt Lake City to attend the Pacific Coast Oto-ophthalmological Society, which met July first and second; and thence to Portland for the meeting of the American Medical Association.

At the Portland meeting of the American Medical Association, Dr. Thomas B. Holloway of Philadelphia was elected chairman of the Section on Ophthalmology for the ensuing year, and Dr. Joseph McCool of Portland vice-chairman. The meeting in 1930 will be held at Detroit.

International Congress of Ophthalmology at Amsterdam, September 5 to 13, 1929. The national committee in charge of the organization of the Congress reports that up to July 1, 1929, nearly seven hundred ophthalmologists had qualified for membership, and that 232 scientific communications, covering all branches of ophthalmology, have been received and will be presented during the meetings of the Congress. Ophthalmologists still desiring to qualify for membership should as promptly as possible send the subscription of Dutch Fl. 25 ($10.00 in American money) to the treasurer, Dr. H. M. Roelofsz, Director of the Incassobank, Heerengracht 531, Amsterdam.

Personals

Dr. H. Alexander Brown of San Francisco has returned to his home after spending several months in Europe.

Dr. W. H. Wilmer is occupying his country place in Clarke county, Virginia, for the months of July and August.

Dr. Joseph M. Keller has been promoted to be associate professor of ophthalmology at Saint Louis University school of medicine.

Dr. Victor C. Smith has returned to New Orleans after a several weeks' vacation in New York, Quebec, and other northern cities.

Drs. Smith, Bahn, and Thomas of New Orleans are enlarging their present quarters and will shortly have Dr. W. F. Lamkin associated with them.

Dr. Joseph L. McCool of Portland, Oregon, has been appointed associate clinical professor of ophthalmology in the medical school of the University of California.

Dr. George Franklin Libby of Denver announces his retirement from the practice of ophthalmology. Dr. and Mrs. Libby will make their home in Victoria, British Columbia.

Dr. L. Webster Fox, professor of ophthalmology in the graduate school of the University of Pennsylvania, presided at the annual commencement of the Chester Military Academy, of which he is president.

Dr. A. Bruner, of Cleveland, was recently appointed assistant clinical professor in the school of medicine of Western Reserve University. Dr. Bruner is now enjoying a six weeks' holiday in the eastern states.

Dr. Charles A. Bahn, of New Orleans, was the guest of the Texas Medical Society at Brownsville during May, when he presented a contribution on "Recent advances concerning ocular focal infections".

If our announcement in June created the impression that Dr. Walter R. Parker of Detroit had removed his offices to Ann Arbor this should be corrected. He has not moved from Detroit but did change his Ann Arbor offices.

Colonel Gustavus I. Hogue, Medical Reserve of Milwaukee, attended camp during the month of July at Fort Snelling, Minnesota, with Base Hospital 22, of which Dr. Hogue is the commanding officer.

Dr. and Mrs. William C. Posey of Philadelphia have sailed for Europe and are spending a portion of the summer motoring in the Italian and Austrian Alps. Dr. Posey will arrive in Amsterdam in time to attend the international congress.

Dr. and Mrs. Burton Chance of Mayfield House, Radnor, Pennsylvania, and their daughters sailed July fifteenth for Europe, where they will remain until autumn. Before returning Dr. Chance will attend the international congress in Amsterdam.

Dr. Willian Zentmayer of Philadelphia sailed on August tenth for England. He will join Dr. and Mrs. Emory Hill, at Oxford and will attend the Amsterdam congress before returning to this country late in September.

Dr. M. Paul Motto of Cleveland will attend the international congress. After the congress, he will be the guest of Professor Joseph Imre, director of the national eye hospital in Budapest. Dr. Motto expects to return about November first.

Others who will attend the meeting of the international congress in Amsterdam include the following: Drs. G. E. de Schweinitz and T. B. Holloway, Philadelphia; Arnold Knapp, W. E. Lambert, B. W. Key, B. Samuels, and J. M. Wheeler, New York; George S. Derby and F. H. Verhoeff, Boston; Emory Hill, Richmond; Harry S. Gradle, W. H. Wilder, and E. V. L. Brown, Chicago; C. W. Tooker and William H. Luedde, Saint Louis; A. J. Bedell, Albany; Walter R. Parker, Detroit; A. C. Woods, Baltimore; E. C. Ellett, Memphis; and Melville Black, Denver.

During the Portland meeting of the American Medical Association, Dr. John O. McReynolds of Dallas entertained between two and three hundred guests at a luncheon in connection with the annual session of the Medical Veterans of the World War. Under the presidency of Dr. McReynolds short speeches were made by Mr. George Baker, mayor of Portland, Secretary of the Interior Ray Lyman Wilbur, Major General Merritte W. Ireland, Surgeon General Hugh S. Cumming, a representative of Rear Admiral Chas. E. Riggs, Dr. William S. Thayer (president of the American Medical Association), Dr. Malcolm L. Harris (president-elect of the American Medical Association), and Colonel Louis H. Bauer, Director of Aviation Medicine, Department of Commerce.

The Pacific Coast Oto-ophthalmological Society, at its seventeenth annual meeting, July first and second in Salt Lake City, had on its program Drs. Sanford Gifford, Omaha; Edgar Thomson, New York; Clifford Walker, Los Angeles; and Harry Vanderbilt Würdemann, Seattle. Interest in the meeting was greatly augmented by the presence of members of the "Triological" Society who stopped over on their way to the San Francisco meeting of that society. Victoria, British Columbia, was selected for the meeting place next year, and officers were elected as follows: president; Dr. Arthur Jones, Boise, Idaho; first vice-president, Dr. Chester Bowers, Los Angeles; second vice-president, Dr. Frederick T. Hyde, Port Angeles, Washington; secretary-treasurer, Dr. Walter F. Hoffman, Seattle.

At the meeting of the American Ophthalmological Society held at Hot Springs, Virginia, June twelth, the following officers were elected: president, Dr. Wm. Campbell Posey, Philadelphia; vice-president, Dr. Arnold Knapp, New York; secretary-treasurer, Dr. Emory Hill, Richmond, Virginia; and editor of transactions, Dr. John M. Griscom, Philadelphia.

The Eye, Ear, Nose, and Throat Club of Georgia met in Atlanta on May eighth and was addressed by Drs. Morris Fishbein, Chicago, and Grady E. Clay, Atlanta. Dr. George B. Smith, Rome, was elected president; Dr. Cecil Stockard, Atlanta, vice-president; and Dr. William O. Martin, Atlanta, secretary-treasurer. The club contributed fifty dollars to the Abner W. Calhoun lectureship fund.

The eye and ear section of the Kentucky State Medical Association met at Lexington, Kentucky, May twenty-second and twenty-third, under the presidency of Dr. J. D. Williams of Ashland. The guest of honor at the meeting was Dr. Meyer Wiener of Saint Louis, who addressed the section on "Some practical points in eye surgery". The following officers were elected for the ensuing year: president, Gaylord C. Hall, Louisville; vice-president, J. T. Dunn, Richmond; treasurer, Samuel B. Marks, Lexington; secretary, Walter Dean, Louisville.